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CATECHISM SERIES

# MATERIA MEDICA

## COMPLETE VOLUME

BY

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# MATERIA MEDICA.

## PART I.

*What is meant by the Term "Pharmacology"?*

It is the science which treats of the actions of drugs both physiologically and pathologically.

*What is meant by "Therapeutics"?*

It is the science of curing disease, and may be "Rational," *e.g.* when we understand the nature of the disease and the pharmacological action of the drug; or it may be "Empirical," *e.g.* when we do not know why a remedy is efficient.

## ALKALOIDS.

*Define Alkaloids.*

They are active nitrogenous principles of organic compounds, and have an alkaline reaction, combining with acids to form salts. They are compound ammonias, because they contain nitrogen, combined with something chemically equivalent to the three hydrogen atoms of ammonia. They are sparingly soluble in water, and constitute the physiologically active part of the plant. Their Latin names end in "ina"; the English termination being "ine."

*Enumerate the Official Alkaloids.*

Aconitina, Atropina, Caffeina, Cocaina, Codeina, Strychnina.

*What is Aconitina and its Dose?*

It is the alkaloid obtained from Aconitum napellus. It is never administered internally.

*How is it used and what Precautions are necessary?*

In the form of the official ointment, Unguentum Aconitina, it is sometimes used in facial neuralgia, as it produces local anæsthesia by paralysing the sensory nerve endings. The skin should be sound, as it is very quickly absorbed.

*Describe Atropina and give its Dose.*

It is the alkaloid obtained from Atropa Belladonna and other plants of the natural order Solanaceæ. Its dose is from $\frac{1}{200}$ to $\frac{1}{100}$ of a grain.

*Mention its Preparations.*

Unguentum Atropinæ, Atropinæ Sulphas (similar dose). The preparations of the sulphate are Lamellæ Atropinæ, each containing $\frac{1}{1000}$ grain; Liquor Atropinæ Sulphatis, strength 1 per cent., dose $\frac{1}{2}$ to 1 minim.

*What are the External Actions of Atropine?*

It must be mixed with some absorbent preparation, such as glycerin, alcohol, or camphor, or placed on an abraded surface, before it exerts its action. It then paralyses the terminations of the sensory nerves, acting as a local anæsthetic and anodyne, at the same time rendering the secretions of the skin less active.

*In what Ways is Atropine administered internally?*

As the liquor by the mouth, or, in solution, hypodermically.

*Describe its Action on the Nervous System.*

The peripheral terminations of all the secretory nerves are depressed, so that active secretions are diminished. The motor nerves are not affected.

*Name some Symptoms noticeable after Administration of Atropine.*

(1) The pupils are dilated, and there is loss of accomodative power, owing to paralysis of the third nerve.

(2) Dryness of mouth and throat, owing to paralysis of the chorda tympani nerve.

(3) Absence of perspiration, skin flushed, and sometimes a red rash, owing to paralysis of "sweat" nerves.

(4) Secretion of milk (if present) is arrested, owing to paralysis of lacteal nerves.

(5) Increase in pulse-rate, owing to paralysis of cardiac inhibitory nerves.

(6) Cough (if present) is lessened, bronchial secretion is diminished, and respiration is quicker and deeper, owing to paralysis of the afferent and efferent pulmonary fibres of the vagi nerves.

*What is Theine?*

It is Caffeine, an alkaloid present in common tea (Camellia Thea).

*What Alkaloid is obtained from Cocoa?*

Theobromine (not official). There is an official compound called "Diuretin," which is Theobrominæ et Sodii Salicylatis, dose 10 to 20 grains.

*Give the Preparations of Caffeine and their Doses.*

Caffeinæ Citras, which is used in making Caffeinæ Citras Effervescens. Caffeine, 1 to 5 grains: Citrate of Caffeine, 2 to 10 grains.

*Why do excessive Tea-drinkers suffer from Cardiac Palpitation?*

Because Caffeine, in moderate doses, stimulates the cardiac muscle and increases the rate of the cardiac beat, whilst large doses cause the heart to become irregular.

*In what Class of Cases is Caffeine beneficial?*

In cardiac cases, with aortic or mitral obstruction, when it is desired to exercise a stimulant effect on the heart. It may be combined with strychnine. Also in cardiac cases with dropsy it is beneficial on account of its diuretic action; the latter action also accounting for its use in cases of pleuritic effusion.

*What is its Effect on the Cerebrum?*

It stimulates the brain, and renders the special senses more alert, increasing the power to do muscular work.

*Is Citrate of Caffeine a Stable Salt?*

No. On the addition of water, it is decomposed with liberation of free caffeine, but on adding more water it becomes re-dissolved.

*How is Cocaine obtained, and what are its Preparations?*

From Coca leaves (Erythroxylum Coca) and its varieties. The preparations are—Unguentum Cocainæ, 4 per cent. Cocainæ Hydrochloridum, dose $\frac{1}{10}$ to $\frac{1}{4}$ grain.

From the Hydrochloride are obtained—

Injectio Cocainæ Hypodermica, 5 per cent., dose 5 to 10 minims.

Lamellæ Cocainæ, each containing $\frac{1}{80}$ grain.

Trochiscus Krameriæ et Cocainæ, each containing $\frac{1}{20}$ grain.

*Describe the Effect of a Hypodermic Injection of Cocaine.*

It stimulates the vaso-constrictor nerves of the local vessels, thus acting as a hæmostatic, and paralyses the local sensory nerves, thus acting as a local anæsthetic.

*What Effects are produced by Oral Administration?*

Its anæsthetic influence is recognised by the abolition of taste, and the absence of hunger sensation. Moderate doses

abolish fatigue, bodily and mentally, but a single large dose will cause mental excitement, delirium, and convulsions.

*Describe its Effect on the Eye.*

There is complete local anæsthesia with wide dilatation of the pupil which is feebly responsive to light, and the vessels of the eye become constricted.

*What is its Ophthalmic Antidote?*

Physostigmine.

*What are "Cocaine Bugs"?*

A sensation of little animals creeping on the skin, which is often experienced by habitual users of Cocaine.

*Which Alkaloidal Salt has Properties similar to Cocaine?*

Benzaminæ Lactas, dose $\frac{1}{8}$ to $\frac{1}{2}$ grain.

*How is Codeina obtained and what is its Dose?*

From opium or morphine. Dose $\frac{1}{4}$ to 1 grain.

Its alkaloidal salt is Codeinæ Phosphas. Dose $\frac{1}{4}$ to 1 grain. It is used in the preparation of Syrupus Codeinæ Phosphatis. Dose $\frac{1}{2}$ to 2 drams.

*Mention the Uses of Codeine.*

To allay cough in phthisis, to relieve ovarian pain, and to lessen glycosuria in diabetes. It is less physiologically active than morphine.

*What is Strychnina and what is its Dose?*

It is the alkaloidal principle of Nux Vomica. Its dose is $\frac{1}{64}$ to $\frac{1}{16}$ grain.

*What other Alkaloid is present?*

Brucine, but this is not official.

*Give the Preparations of Strychnina.*

Syrupus Ferri Phosphatis cum Quinina et Strychnina, containing $\frac{1}{32}$ of a grain in each dram, dose $\frac{1}{2}$ to 1 dram. Strychninæ Hydrochloridum, dose $\frac{1}{64}$ to $\frac{1}{16}$ grain.

*What are the Preparations of Strychnine Hydrochloride?*

Injectio Strychninæ Hypodermica, ·75 per cent., dose 5 to 10 minims.

Liquor Strychninæ Hydrochloridi, 1 per cent., dose 2 to 8 minims.

*Describe the Actions of Strychnine.*

It exerts its chief action on the anterior cells of the spinal cord, enormously increasing their reflex excitability and irritability, thus explaining the cause of convulsions in strychnine poisoning. The convolutions of the brain are not affected, but the medullary centres, being continuations of the anterior cornua of the cord, are powerfully stimulated, especially the respiratory centre. The vaso-motor centre is also excited, and this, in conjunction with the stimulating effect on the heart, causes a rise in blood pressure, which is also accentuated by the increased peripheral resistance due to frequent muscular contractions.

*How is Strychnine eliminated?*

Slowly and unaltered by the kidneys. It tends to accumulate and tolerance is never established.

## ALKALOIDAL SALTS.

*Name the Alkaloidal Salts obtained from Opium or Morphine.*

| | | |
|---|---|---|
| 1. Apomorphinæ Hydrochloridum, | dose $\frac{1}{10}$ to $\frac{1}{4}$ | grain. |
| 2. Codeinæ Phosphas, | ,, $\frac{1}{4}$ to 1 | ,, |
| 3. Diamorphinæ Hydrochloridum, | ,, $\frac{1}{25}$ to $\frac{1}{8}$ | ,, |
| 4. Morphinæ Acetas, | ,, $\frac{1}{8}$ to $\frac{1}{2}$ | ,, |
| 5. Morphinæ Hydrochloridum, | ,, $\frac{1}{8}$ to $\frac{1}{2}$ | ,, |
| 6. Morphinæ Tartras, | ,, $\frac{1}{8}$ to $\frac{1}{2}$ | ,, |

*What is peculiar about the Dose of Apomorphine, and what is its Preparation?*

Dose by the mouth ($\frac{1}{10}$ to $\frac{1}{4}$ grain) is greater than the dose by hypodermic injection ($\frac{1}{20}$ to $\frac{1}{10}$ grain).

Its preparation is Injectio Apomorphinæ Hypodermica, 1 per cent., dose 5 to 10 minims.

*Describe its Uses.*

It is the best official emetic, being certain, prompt, and powerful. It does not irritate the stomach, but acts solely on the vomiting centre in the medulla, thus being an indirect emetic. It is also used to diminish the viscidity of the sputum in chronic bronchitis.

*What Preparation has Morphinæ Acetas?*

Liquor Morphinæ Acetatis, strength 1 per cent., dose 10 to 60 minims.

*Enumerate the Preparations of Morphine Hydrochloride and of the Tartrate.*

Liquor Morphinæ Hydrochloridi, 1 per cent., dose 10 to 60 minims.

Suppositoria Morphinæ, each containing $\frac{1}{4}$ grain.

Tinctura Chloroformi et Morphinæ Composita, 1 per cent., dose 5 to 15 minims.

Trochiscus Morphinæ, each containing $\frac{1}{32}$ grain.

Trochiscus Morphinæ et Ipecacuanhæ, each containing $\frac{1}{32}$ grain.

The preparations of Morphine Tartrate are Injectio Morphinæ Hypodermica, 2·5 per cent., dose 5 to 10 minims.

Liquor Morphinæ Tartratis, 1 per cent., dose 10 to 60 minims.

*What Advantages does Morphine possess over Opium, medicinally?*

1. Morphia is more readily absorbed, therefore acts quicker.

2. Morphia is more suited for hypodermic use.
3. Morphia is less likely to upset the stomach.
(For action of Morphine *vide* Opium).

*Mention the Uses of Diamorphine Hydrochloride.*

By prolonging inspiration, increasing the depth of respiration, and depressing the respiratory centre, it allays incessant dry cough.

It does not often produce the headache and other disagreeable effects which follow Morphine.

*Enumerate the "Solanaceous" Alkaloidal Salts.*

| | | |
|---|---|---|
| 1. Atropinæ Sulphas, | dose $\frac{1}{200}$ to $\frac{1}{100}$ | grain. |
| 2. Homatropinæ Hydrobromidum, | " $\frac{1}{60}$ to $\frac{1}{30}$ | " |
| 3. Hyoscinæ Hydrobromidum, | " $\frac{1}{200}$ to $\frac{1}{100}$ | " |
| 4. Hyoscyaminæ Sulphas, | " $\frac{1}{200}$ to $\frac{1}{100}$ | " |

*What Preparation has Homatropine Hydrobromide, and what is its Action?*

Lamellæ, each containing $\frac{1}{100}$ grain.

It is used in ophthalmic work, and is similar to Atropine, but its action on the eye is of shorter duration.

*What is Scopolamine Hydrobromide?*

It is Hyoscine Hydrobromide.

*Mention the Uses of Hyoscyamine Sulphate.*

It and the preceding are employed as cerebral depressants in acute mania, delirium tremens, etc. Scopolamine, combined with morphine, is used hypodermically to diminish sensibility in labour, without interfering with uterine functions, producing the "Twilight Sleep."

*What is Sulphate of Eserine?*

Physostigminæ Sulphas, an alkaloidal salt obtained from Calabar Beans, the seeds of Physostigma Venenosum.

*Describe the Actions of Physostigmine.*

Internally it is quickly absorbed, and by stimulating the terminations of secretory nerves, it increases glandular secretions. It depresses the cardiac and respiratory centres, but it exerts its influence mostly on the spinal cord, where, by its action on the anterior cornual cells, it inhibits reflex activity.

*What Use has been made of its Action on the Spinal Cord?*

It has been used as an antidote for strychnine poisoning.

*How does it act on the Eye?*

It stimulates the third nerve, causing contraction of the pupil, diminution of intra-ocular tension, and paralysis of accomodation.

*What is its Antidote?*

Atropine.

*To what other Alkaloidal Salt is Atropine an Antidote?*

Pilocarpinæ Nitras.

*Give the Source of Pilocarpine and also its Dose and Action.*

Pilocarpus Microphyllus (jaborandi leaves). Its dose $\frac{1}{20}$ to $\frac{1}{5}$ grain hypodermically.

It is quickly absorbed and soon produces great salivation by direct stimulation of the chorda tympani; in the same way by stimulating the nerves in the sweat glands, there is profuse perspiration. By stimulating the cardiac vagal terminals the heart is slowed.

*What Effect has it on the Eye and what are its Uses?*

There is great contraction of the pupil, increased tension of the eyeball, and disturbance of vision.

It is used to remove effusions, dropsies, ascites, etc., in

kidney disease, the perspiration containing potash salts and urea.

In diabetes insipidus it lessens the amount of urine.

In diabetes mellitus it checks the thirst.

*Name the Alkaloidal Salts got from Cinchona Succirubra.*

| | |
|---|---|
| Quininæ Hydrochloridum, | Dose 1 to 10 grains. |
| Quininæ Hydrochloridum Acidum, | Do. do. |
| Quininæ Sulphas, | Do. do. |

*Give the Preparations of Quinine Hydrochloride and the Sulphate.*

| | |
|---|---|
| Tincturæ Quininæ, | Dose ½ to 1 dram. |
| Vinum Quininæ, | Dose ½ to 1 ounce. |
| Ferri et Quininæ Citras, | Dose 5 to 10 grains. |
| Pilula Quininæ Sulphatis, | Dose 2 to 8 grains. |
| Syrupus Ferri Phosphatis cum Quinina et Strychnina, | Dose ½ to 1 dram. |
| Tincturæ Quininæ Ammoniata, | Do. do. |

*Describe the Actions of Quinine.*

Any salt of quinine administered is converted, in the stomach, into a chloride, and acts as a bitter and a stomachic, being readily absorbed into the blood, where it is held in solution as a carbonate. It seems to have the power of arresting the movements of the white corpuscles, but has no effect on the red corpuscles, and diminishes the oxygenation of the blood.

*Describe the Antipyretic Effect of Quinine.*

It acts on the thermogenetic centres and reduces pyrexia, not by increasing the loss, but by diminishing the production of heat.

*Mention some of its Uses.*

In malaria, to arrest the paroxysms, and as a preventive.

To reduce temperatures.

In neuralgia, for headache and other nervous affections.

As a tonic, in small doses.

*What is "Cinchonism"?*

It is a series of physiological symptoms, produced by a large or repeated small doses of quinine, and consists of noises in the ears, partial deafness, indistinct vision, throbbing headache, loss of appetite, and nausea.

*Give the Source, Dose, and Use of Pelletierinæ Tannas.*

It is a mixture of the alkaloids obtained from the bark of the root and stem of Punica Granatum (Pomegranate).

Its dose is 2 to 8 grains, and it has a specific action on the tapeworm acting as a vermicide.

*How would you administer it?*

It should be given on an empty stomach, as it passes, unchanged in the stomach, into the intestine where sufficient is dissolved to kill the parasite. It should be followed two hours later by a purge.

*Describe the Action of Diuretin* (*vide* Caffeine).

It acts as a diuretic by exciting the renal epithelium.

## GLUCOSIDES.

*What is a Glucoside?*

It is a neutral crystalline compound, containing C.H.O. which in the presence of water is decomposed by acids, alkalies, or ferments into glucose and another substance, different in each case.

*Name the Official Glucosides.*

Chrysarobin. Salicin. Santonin.

*What is Chrysarobin and what are its Uses?*

It is a mixture of substances extracted from Araroba by hot benzene.

The official ointment is used for ringworm and psoriasis.

It is an irritant and stains everything it touches a yellowish brown colour; this stain may be removed by a weak solution of caustic soda.

*How would you prevent it staining?*

By mixing it with a solution of gutta percha.

*State what you know about Salicin and give its Dose.*

It is a glucoside obtained from various species of Salix and of Populus. It is insoluble in acids and therefore it passes unchanged through the stomach, but is dissolved by the alkaline secretions of the bowels, when it becomes split up into Salicylic, Salicyluric, and Salicylous acids, which probably become absorbed by the blood as Sodium Salicylate. It is an antiseptic, and being excreted by the kidneys, it acts as a urinary antiseptic. Its dose is 5 to 20 grains.

*What is Santonin? Give its Dose, Use, and Mode of Administration.*

A glucoside obtained from Santonica, the dried unexpanded flower-heads of Artemisia Maritima. It is given in 1 to 3 grain doses.

It is used as an Anthelmintic in cases of roundworm, Ascaris lumbricoides, and is administered best with a small quantity of castor oil, after a moderate fast, at bedtime, so that the unpleasant optic symptoms, *e.g.* yellow vision, are prevented.

*What Effect has it on Threadworms?*

As these usually infest the lower bowel, it is not to be relied on when given by the mouth, owing to its absorption in the higher bowel, but it may be administered in the form of a suppository.

## GUMS.

*What is a Gum?*

It is an exudation from a plant and contains—

(*a*) Arabin or soluble gum.
(*b*) Bassorin or partially soluble gum.
(*c*) Cerasin or insoluble gum.

*Name the Official Gums and their Uses.*

Acaciæ Gummi.
Gummi Indicum.
Tragacantha.

To make the official mucilages, which act as demulcents, but are chiefly used in dispensing, to suspend or emulsify oils or other insoluble substances in aqueous mixtures.

## RESINS.

*What are Resins? Name those which are Official, giving their Doses.*

They are complex bodies, non-volatile, solid, brittle, and insoluble in water. They are soluble in alkalies, forming resin soaps. They may be formed by oxidation of volatile hydro-carbons, or by distillation of oleo-resins.

1. Resina, no dose. 2. Guaiaci Resina, 5-15 grains. 3. Jalapæ Resina, 2-5 grains. 4. Kaladanæ Resina, 2-8 grains. 5. Podophylli Resina, ¼-1 grain. 6. Podophylli Indici Resina, ¼-1 grain. 7. Scammoniæ Resina, 4-8 grains.

*What is Resin?*

It is the residue left after distillation of oil of turpentine.

*Mention the Source of Guaiacum Resin and its Preparations.*

It is obtained from the stem of Guaiacum Officinale. Mistura Guaiaci. Tinctura Guaiaci Ammoniata. Trochiscus Guaiaci Resinæ.

*How are the remaining Resins obtained?*

A strong alcoholic tincture is prepared from the drug, and on adding water to this the resin is precipitated. In the case of Podophyllum Resin the water must be acidulated.

*Compare their Actions.*

Jalap is a hydragogue purgative, does not act until it reaches the duodenum, causes great secretion of intestinal juice, slightly stimulates the intestinal muscular coat, and purges in about four hours.

Scammony acts in a similar manner, but causes less secretion of fluid and more muscular stimulation.

Kaladana acts similarly to Jalap.

Podophyllum is a powerful gastro-intestinal irritant, taking about ten hours to purge, and the motion, which is liquid, is bile-stained.

*Why is Tincture of Guaiacum Ammoniated?*

Because Resins are soluble in alkalies, forming soaps, otherwise the Guaiacum Resin would have to be suspended in the tincture.

*What other Drugs are prepared on this Principle?*

Ammoniated Tincture of Valerian, and Decoction of Aloes.

## GUM-RESINS.

*What is a Gum-Resin and how is it affected by Water?*

A natural exudation from a plant, and consisting chiefly of gum, resin, and a volatile oil. The gum is dissolved and suspends the insoluble resin in water.

*Name the Official Gum-Resins and state the Dose of each.*

Ammoniacum, 5 to 15 grains; Asafetida, 5 to 15 grains; Myrrha, 5 to 15 grains.

*How would you distinguish them?*

Ammoniacum is pale brown externally, milky white internally, and has a faint non-alliaceous odour.

Asafetida is a dull yellow, and has a strong alliaceous odour.

Myrrh is a reddish brown colour and has an aromatic odour.

*What Preparation has Ammoniacum and what is its Action?*

Mistura Ammoniaci, dose ½ to 1 fluid ounce.

Expectorant and stimulant, being excreted by the bronchi.

*Name the Preparations of Asafetida and their Uses.*

Pil. Aloes et Asafetidæ, dose 4 to 8 grains.

Spiritus Ammoniæ Fetidus, dose 20 to 90 minims.

Tinctura Asafetidæ, dose ½ to 1 fluid dram.

Asafetida stimulates the muscular intestinal coat, expelling flatus. It is also credited with beneficial effect in hysteria, probably mental, owing to its nauseous qualities.

*Name the Preparations of Myrrh and describe its Actions.*

Tinctura Myrrhæ, dose ½ to 1 dram.

Pil. Aloes et Myrrhæ, dose 4 to 8 grains.

It increases the vascularity and peristalsis of the intestinal tract, increases the number of blood leucocytes, is excreted by the bronchial and genito-urinary mucous membranes, and stimulates and disinfects their secretions.

## OLEO-RESINS.

*What are Oleo-Resins?*

The products of oxidation of volatile oils, which, when distilled, split up into resins and volatile oils.

*Name those that are Official.*

Copaiba, dose ½ to 1 dram. Terebinthina Canadensis.

*What are the Source and Actions of Copaiba?*

It is obtained by incision from the trunk of various species of Copaifera. It is quickly absorbed and excreted by all the mucous membranes, which it stimulates, and is therefore used as a stimulating disinfectant to the genito-urinary tract. It is also used as an expectorant. Being excreted by the skin also, it is liable, by its irritant effect, to produce an erythematous rash.

*How is Canada Balsam used?*

Chiefly for its physical property of drying to form an adhesive varnish. It enters into the preparation of Collodium Flexile.

## BALSAMS.

*What are Balsams and which are Official?*

Mixtures of oleo-resins with Benzoic or Cinnamic Acids, or with both.

Benzoinum or Gum Benjamin.
Balsamum Peruvianum, dose 5 to 15 minims.
Balsamum Tolutanum, dose 5 to 15 grains.
Styrax Præparatus.

*State the Source and Characters of Benzoin.*

It is obtained from the incised stem of Styrax Benzoin in reddish-brown or greyish-brown masses, brittle, but softening when warmed. Similar in appearance to granite, it has an agreeable aromatic odour.

*Enumerate its Preparations.*

Adeps Benzoatus. Sevum Benzoatum. Tinctura Benzoini Composita. Acidum Benzoicum.

*Contrast the Balsams of Peru and Tolu.*

Balsam of Peru is a natural exudation from the stem of Myroxylon Pereira.

Balsam of Tolu is a natural exudation from the stem of Myroxylon Toluiferum.

Balsam of Peru is a viscid liquid, like treacle, with a balsamic odour.

Balsam of Tolu is a soft tenacious solid, becoming hard when old, and has a balsamic odour.

Balsam of Peru is chiefly used, externally, for indolent sores and skin diseases.

Balsam of Tolu is only used as an expectorant.

Balsam of Peru has no official preparations.

Balsam of Tolu is used for making Syrupus Tolutanus and Tinctura Tolutana.

*What is Storax?*

It is a brownish-yellow semi-fluid balsam obtained from the wounded trunk of Liquidambar Orientalis, being purified by solution in alcohol. It has similar actions to the two preceding balsams.

## STEAROPTENES.

*What are Stearoptenes and which are Official?*

They are solidified volatile oils.

Camphora, dose 2 to 5 grains.

Menthol, dose $\frac{1}{2}$ to 2 grains.

Thymol, dose $\frac{1}{2}$ to 2 grains. As an anthelmintic, dose 15 to 30 grains.

*Describe the Source and Characteristics of Camphor.*

It is obtained from Cinnamomum Camphora and purified by sublimation. It is a white crystalline substance in solid translucent masses, or in rectangular tablets; very tough and hard to powder, unless a few drops of alcohol are added. It has a powerful odour and bitter taste, floats on water, burns readily, and sublimes entirely when heated. If mixed with either chloral hydrate, carbolic acid, menthol, or thymol, it forms a thick liquid.

*Enumerate its Preparations with their Doses.*

Aqua Camphoræ, dose 1 to 2 ozs. Linimentum Camphoræ.
Linimentum Camphoræ Ammoniatum.
Spiritus Camphoræ, dose 5 to 20 minims.
Tinctura Camphoræ Composita, dose ½ to 1 dram.

*What other Preparations contain Camphor?*

All the official liniments except Croton, Lime, Ammonia, and Potassium Iodide.
Unguentum Hydrargyri Compositum.

*Describe the Action of Camphor.*

It is a mild gastric stimulant, is quickly absorbed, and is excreted in an altered form in the urine. It is a direct and reflex cardiac stimulant. It is a mild diaphoretic, being excreted by the skin to a slight extent. It acts variably on the nervous system; in some patients a small dose will cause exhilaration, whilst others may be depressed. Applied externally, it causes a slight local anæsthesia.

*What is Menthol and what are its Preparation and Action?*

A crystalline substance obtained by cooling the oil distilled from the fresh herb of Mentha Arvensis. Has an odour of peppermint and is always moist from adhering oil.
Emplastrum Menthol.
Applied externally, it causes local anæsthesia. It is seldom used internally.

*Mention the Source and Action of Thymol.*

From the volatile oils of Thymus Vulgaris, Monarda Punctata, and Carum Copticum.
It is used externally as an antiseptic and antiparasitic. When administered in large doses for Ankylostoma Duodenale, it should be some time after the intestines have been emptied by a smart purge, and, to prevent its absorption, should be given in an oily or fatty substance, or followed in six hours by a dose of castor oil which will expel the killed parasites.

## OILS.

*Give a Classification of the Official Oils.*

1. Fixed oils. 2. Fats. 3. Volatile oils.

*What are Fats?*

They are fixed oils which are solid at ordinary temperatures, and, if extracted by expression, sufficient heat to melt them must be employed. Examples—Oleum Theobromatis, Adeps Preparatus.

*Contrast the Fixed and Volatile Oils.*

Fixed Oils—

(*a*) Obtained from animal or vegetable kingdoms by expression and, if possible, without heat.
(*b*) Compounds of fatty acids with glyceryl.
(*c*) Form soaps with caustic alkalies or metallic oxides and give glycerin as a bye-product.
(*d*) Insoluble in water, but soluble in alcohol, chloroform, or ether.
(*e*) All lighter than water.
(*f*) Leave a permanent stain on paper.
(*g*) Have not an aromatic odour.
(*h*) Contain oleic, palmitic, and stearic acids.

Volatile Oils—

(*a*) Obtained from the vegetable kingdom by distillation.
(*b*) Compounds of hydrogen and carbon.
(*c*) Do not form soaps with caustic alkalies nor metallic oxides.
(*d*) Practically insoluble in water, but soluble in alcohol, chloroform, or ether.
(*e*) Lighter than water, except the oils of cinnamon, cloves, and mustard.
(*f*) Do not leave a permanent stain on paper.
(*g*) Possess an aromatic odour.
(*h*) Contain alcohol, aldehydes, and phenol derivatives.

*Name, with Doses, the Fixed Oils having a Purgative Action.*

Oleum Amygdalæ, no dose stated. Oleum Crotonis, $\frac{1}{2}$ to 1 minim. Oleum Olivæ, no dose stated. Oleum Ricini, 1 to 8 drams.

*Contrast their Actions.*

Olive Oil retards the flow of gastric juice, and thus acts as a protective to gastric ulcers, which would be irritated by the acid of the gastric juice. It is a good mild laxative, stimulating the intestinal peristalsis, and increasing the biliary flow.

Almond Oil acts in a similar manner.

Croton Oil is a powerful irritant, greatly increasing the vascularity of the gastric and intestinal mucous membranes, and increasing intestinal secretions. Its action, accompanied by much griping, begins in the stomach; the bowels are opened in an hour or two, the motions being very fluid and often containing blood.

Castor Oil begins its action in the duodenum, causes no griping, and acts in about five hours.

*What is Oleum Morrhuæ, and when should it not be administered?*

Cod liver oil expressed from the fresh liver of the cod-fish. In cases of pyrexia, hæmoptysis, dyspepsia, and diarrhœa.

*Give the Actions of Volatile Oils generally.*

Used externally, they cause considerable vascular dilatation, first causing a sensation of tingling and pain, which is followed by anæsthesia of the part to which they are applied. When rubbed into the skin they act as stimulants and rubefacients. Used internally, they dilate the vessels of the mucous membranes they come in contact with, the result being stimulation of the glands, *e.g.* increased salivation and excitation of gastric secretion. They also diminish excessive and irregular peristalsis, and by stimulating the gastric nerves they act as reflex cardiac stimulants.

*What is the usual Dose of Volatile Oils, and which are the Exceptions?*

½ to 3 minims.

The exceptions are:—

Ol. Copaibæ, 5-20 minims. Ol. Cubebæ, 5-20 minims.
Ol. Gaultheriæ, 5-15 minims. Ol. Santali, 5-30 minims.
Ol. Terebinthinæ Rect., 2-10 minims. As an anthelmintic, 3-4 drams.

*Mention the Preparations of Oil of Turpentine.*

Linimentum Terebinthinæ; Linimentum Terebinthinæ Aceticum.

*How is Oil of Turpentine obtained?*

It is distilled from the oleo-resin (crude turpentine) which exudes from various species of Pinus, and is subsequently rectified.

*Mention some of its Characteristics, and give its Actions, external and internal.*

It becomes oxidised on exposure to air, and is then converted into an oleo-resin. It will dissolve resin, wax, phosphorus and sulphur.

*Externally.*—It causes local vascular dilatation, acting as a rubefacient, and if applied repeatedly it acts as a vesicant.

*Internally.*—In the stomach it dilates the vessels, increases gastric secretion, and reflexly stimulates the heart. In the intestines it has a similar effect, lessens griping and expels gas, but if administered in large doses it causes severe vascular dilatation and leads to purging with hæmorrhage, hence its use as a vermicide, in 2 to 4 dram doses, is attended with danger.

*What Effect has it on the Genito-urinary Tract?*

Scanty doses may lead to severe lumbar pain, irritation of the urinary passages, difficulty in micturition, albuminuria, and hæmaturia, and for these reasons it should never be given in cases of nephritis.

*In what Cases of Poisoning is it used?*

It is an antidote to phosphorus.

*What is Oil of Wintergreen?*

Oleum Gaultheriæ.
Methyl Salicylas is an artificial oil of wintergreen. Dose, 5-15 minims.

*What is Ol. Phosphoratum?*

It is a true 1 per cent. solution of phosphorus in almond oil, and has a dose of 1-5 minims.

## INSPISSATED JUICES.

*What is an Inspissated Juice, and which are Official?*

It is a juice obtained from a plant by incision, and allowed to evaporate to dryness by exposure to the air.
The official juices are:—Aloe. Buteæ Gummi. Kino. Kino Eucalypti. Opium.

*Give the Source and Dose of Aloe, and its Characters.*

The inspissated juice of Alœ Chinensis, Aloe Perryi and other species.
Dose, 2-5 grains.
It occurs in hard, yellowish-brown or dark-brown masses, with a characteristic odour and extremely bitter taste.

*What other Substances are like it?*

Guaiacum Resin and Jalap Resin, but these are not bitter.

*Name the Active Principle of Aloes, and give its Preparations.*

Aloin, dose ½-2 grains. Extract. Aloes, dose 1-4 grains. Decoctum Aloes Compositum, dose ½-2 ounces. Pil. Aloes, dose 4-8 grains. Pil. Aloes et Asafetidæ, dose 4-8 grains.

Pil. Aloes et Ferri, dose 4-8 grains. Pil. Aloes et Myrrhæ, dose 4-8 grains. Pil. Colocynthidis Composita, dose 4-8 grains. Pil. Colocynth. et Hyoscyami, dose 4-8 grains. Pil. Rhei Co., dose 4-8 grains, Tinctura Benzoini Comp., dose ½-1 dram. Extractum Colocynthidis Comp. dose 2-8 grains.

*Describe the Action of Aloes.*

It is a slow purgative, usually taking from fifteen to twenty hours to act. It exerts its influence on the colon, stimulating its muscular coat, and produces little influence in the small intestine, except to increase the rate of the flow of bile. It may give rise to griping by causing irregular muscular contractions in the colon, and is thus best administered with a carminative, which will be noticed in all its official pills. It will also increase the menstrual flow, and should not be administered in pregnancy.

*Name the Official Varieties of Kino and their Sources.*

1. Buteæ Gummi—Bengal Kino—from the stem of Buteæ Frondosa. Dose, 5-20 grains.

2. Kino—from the trunk of Pterocarpus Marsupium. Dose, 5-20 grains.

3. Kino Eucalypti—from the stem of various species of Eucalyptus. Dose, 5-20 grains.

*N.B.*—Kino is insoluble in water, Eucalyptus Kino is soluble.

*What is the Active Principle of Kino?*

Kino-tannic Acid, to which it owes its astringent properties.

*Name the Kino Preparations with their Doses.*

Pulvis Kino Compositus, 5-20 grains. Tinctura Kino, ½-1 dram. Pulvis Catechu Compositus, 10-60 grains. Trochiscus Kino Eucalypti.

*Mention the Source of Opium, and describe its Characters.*

It is obtained by incision from unripe capsules of white poppy—Papaver Somniferum. It is found in rounded

irregular masses, plastic, moist and reddish-brown when fresh, but becomes harder and darker when kept. Most specimens show some leaf. When dried and powdered it must yield from 9·5 to 10·5 per cent. morphine.

*Name some of the Alkaloids of Opium.*

Morphine, Codeine, Thebaine, Narcotine, Papaverine, Laudanine, Pseudomorphine, Meconidine, etc.

*Name two Organic Acids found in it.*

Meconic Acid, Thebolactic Acid.

*Give the Dose of Opium, and name, with Strength, its Official Liquid Preparations.*

½ to 2 grains.

| | Per cent. | | Dose. |
|---|---|---|---|
| Extractum Opii Liquidum, contains | ·75 | Morphine, | 5-30 min. |
| Tinctura Opii ,, | 1 | ,, | 5-30 min. |
| Tinctura Camphoræ Compositæ ,, | ·05 | ,, | ½- 1 dr. |
| Tinctura Opii Ammoniata ,, | ·1 | ,, | ½- 1 dr. |
| Linimentum Opii ,, | ·5 | | |

*Name, with Strength, the Official Dry Preparations of Opium.*

| | Per cent. | | Dose. |
|---|---|---|---|
| Extractum Opii Siccum, contains | 20 | Morphine, | ¼- 1 gr. |
| Pilula Ipecacuanhæ cum Scilla ,, | ·5 | ,, | 4- 8 gr. |
| ,, ,, Urginea ,, | ·5 | ,, | 4- 8 gr. |
| ,, Plumbi cum Opio ,, | 1·2 | ,, | 2- 4 gr. |
| ,, Saponis Composita ,, | 2 | ,, | 2- 4 gr. |
| Pulvis Cretæ Aromaticus c. opio ,, | ·25 | ,, | 10-60 gr. |
| ,, Ipecacuanhæ Compositus ,, | 1 | ,, | 5-15 gr. |
| ,, Kino Compositus ,, | ·5 | ,, | 5-20 gr. |
| ,, Opii Compositus ,, | 1 | ,, | 5-15 gr. |

Suppositoria Plumbi Composita, contain each ·1 gr. Morphine.
Unguentum Gallæ cum Opio, contains ·75 per cent. Morphine.
Unguentum Myrobalani cum Opio, contains ·75 per cent. Morphine.

*Describe the Action of Opium on the Alimentary Canal.*

It diminishes gastric and intestinal secretions, paralyses the peristaltic action of the bowels, and relieves pain. For these reasons it is liable to cause constipation and indigestion.

*What is its Effect on the Nervous System?*

In small doses there is, at first, excitation of the higher faculties, consisting of an animated expression, feeling of comfort, elevation of spirits and excited imagination, but the faculties of reason and judgment are a little confused. This is followed by depression, torpidity, and sleep, with impossible, but pleasant, dreams; subsequently all responses to sound, light, touch, or pain are abolished. The motor cells of the spinal cord are, at first, slightly stimulated, but soon become depressed, and reflex movements are greatly diminished.

*State the Precautions necessary in administering Opium for Coughs.*

It depresses the respiratory centre and so alleviates coughing, but it is only justifiable when the cause of the cough is due to irritation by an intra-thoracic growth or aneurysm, or in pleurisy without lividity, as it is also a cardiac depressant. It should never be given in the last stages of bronchitis and pneumonia.

*What are some of the Uses of Opium?*

1. In fevers where the pupils are dilated, and there are present sleeplessness, restlessness, delirium, etc. In these cases the brain is usually anæmic—*e.g.* in typhoid fever.

2. In localised inflammatory affections, to reduce pain and spasm and check mucous discharges, as in peritonitis, pleurisy, cystitis (along with calomel).

3. In non-inflammatory brain affections—*e.g.* mania; must not be given in inflammation of the brain-substance, as it might produce hæmorrhage and coma.

4. In diabetes it is said to lessen the amount of sugar excreted. It must not be given in acute or chronic

inflammations of the kidney, as it decreases the excretory function of the kidney, and the urinary constituents and opium are therefore retained in the blood, and poisoning occurs.

5. In hæmorrhages, with restlessness and tossing—usually given along with acetate of lead or gallic acid, as a hæmostatic.

6. Retention of fæces—intestinal obstruction, ileus, twists, spasmodic contractions, intussusceptions, etc., especially in the ileum; give in large doses for a few days. It is also a valuable agent in diarrhœas.

7. In ulcers, callous and varicose, in old people of weak constitution; in recent ulcers of old persons surrounded by much inflammation.

8. In painful conditions generally; best hypodermically to avoid gastric disturbance, especially in women. Hypnotic and anodyne.

9. In cardiac diseases, especially aortic valvular lesions, with great dyspnœa and "anginous symptoms."

*What are the Differences in Action between Morphine and Opium?*

1. Morphine is more readily absorbed and is suitable for hypodermic injections.

2. Opium is liable to derange the digestion and cause constipation.

3. Opium acts as a diaphoretic.

4. Morphine is a more certain anodyne.

*Which Preparation of Opium is used as a Diaphoretic?*

Dover's Powder (Pulv. Ipecac. Co.).

*Contrast the Actions of Atropine and Morphine.*

Atropine is mydriatic, Morphine is myotic.

Atropine is anhidrotic, Morphine is diaphoretic.

Atropine stimulates the respiratory centre, Morphine depresses it.

Atropine stimulates the cerebral convolutions, Morphine depresses them.

Atropine stimulates peristalsis, Morphine decreases it.

## DRUGS OBTAINED FROM ANIMAL KINGDOM.

*What is Cantharidinum?*

It is a colourless, inodorous, crystalline substance, obtained from various species of Cantharis (Spanish Fly), by extraction with chloroform.

*Name its Preparations.*

Acetum Cantharidini, ·05 per cent.
Emplastrum Calefaciens, ·02 per cent. (warming plaster).
Emplastrum Cantharidini, ·2 per cent.
Liquor Epispasticus, ·4 per cent.
Collodium Vesicans, ·4 per cent.
Tinctura Cantharidini, ·01 per cent.
Unguentum Cantharidini, ·033 per cent.

*Name a good Solvent for Cantharidin.*

Acetone, which is the solvent used in Liquor Epispasticus.

*What is Acetum Cantharidini chiefly used for?*

As the basis of many preparations to stimulate hair growth.

*Name some Instances in which Cantharidin is used externally.*

In pleurisy, in pericarditis, in neuralgia, placed over the nerve. In joints with chronic effusion. In mastoid disease.

*Describe the External Action of Cantharidin.*

When applied to unbroken skin, no effect is noticed for two or three hours, then its irritant action begins by causing a tingling, burning pain. In another hour or so its rubefacient action is evident by local vascular dilatation, the next stage being the formation of vesicles, which coalesce to form a large serous bleb; the whole action being completed in from eight to ten hours.

*Describe the Internal Action of Cantharidin.*

Although the tincture has an official dose of from 2 to 5 minims, the drug is seldom used internally. It produces severe gastro-intestinal irritation, and when absorbed into the blood, causes great pain in the loins, followed by a desire to micturate, the urine being small in quantity and containing blood and albumin.

*What Precautions are necessary when blistering with Cantharidin?*

After formation of the bleb the drug should be removed so that it may not be absorbed. It should not be used in renal disease. It should not be applied to a part on which the patient lies. It should not be applied to paralysed limbs.

*What is Cochineal?*

It is the dried fecundated insect Coccus Cacti, which is of a purplish grey colour, and when pulverized produces a dark red powder. It is used only as a colouring agent.

*Which Preparations contain it?*

The compound tinctures of cardamoms and cinchona.
(*N.B.*—Fowler's solution does not contain it.)

*What is Cetaceum and in which Preparation is it used?*

It is spermaceti, a solid wax obtained from the sperm whale. It is employed in the preparation of Unguentum Cetacei, which is used as an emollient.

*Describe Gelatinum and mention its Preparations.*

It is the air dried product of the action of boiling water on skin, tendons, ligaments, and bones.

It is used in preparing Suppositoria Glycerini and all the Lamellæ.

*What is Fel Bovinum Purificatum and what is the Dose and Action?*

Purified Ox Bile, obtained by evaporating fresh ox bile to one quarter its bulk, washing with alcohol, distilling off the alcohol, and evaporating what remains to the consistence of an extract.

Its dose is 5 to 15 grains.

When absorbed, it passes to the liver, increasing its secretion, and acting as a true cholagogue.

*What is Saccharum Lactis?*

It is a crystallized sugar obtained from the whey of milk, and is used chiefly as a diluent.

*Describe Oleum Morrhuæ and give its Action.*

It is a fixed oil obtained by expression at a heat not exceeding 84°C., from the liver of the cod, Gadus Morrhua.

As it contains more free fatty acids than other oils, it saponifies and emulsifies more readily, thus allowing of rapid absorption. It is also easily oxidised, and this, in conjunction with its rapid absorption by the tissues, render it an excellent fat former.

*What is Adrenalinum, and what are its Preparation and Action?*

It is a light brown or nearly white powder obtained from the medullary portion of the suprarenal glands of animals.

Its preparation is Liquor Adrenalini Hydrochloricus, ·1 per cent., dose 10 to 30 minims.

In its action on the circulatory system, it briefly stimulates the accelerator nerve fibres of the heart, thus accelerating the heart's action, but this is quickly followed by indirect stimulation of the vagal centre, and the heart is slowed; at the same time, by direct action on the cardiac muscle, the force of systole is increased. The small arteries are constricted by direct action on nerve endings in the muscular coat, and this, combined with the cardiac action, causes

great rise of blood pressure. These effects are of very short duration.

When applied externally, in cases of hæmorrhage, its powerful local vaso-constrictor action renders it an excellent hæmostatic.

*What is Curd Soap?*

Sapo Animalis. It is stearate of sodium, and is made with sodium hydroxide and a purified animal fat consisting principally of Stearin.

*Which other Soaps are Official?*

Sapo Durus, or Sodium Oleate, obtained from Olive Oil and Caustic Soda.

Sapo Mollis or Potassium Oleate, obtained from Olive Oil and Caustic Potash.

*What Preparations are obtained from the Sheep?*

Sevum Præparatum, Adeps Lanæ, Pepsinum, Thyroideum Siccum.

Suet (Sevum Præparatum) is obtained by purifying the internal abdominal fat of the sheep.

*How is Wool Fat obtained?*

By purifying the fat of sheep's wool freed from water.

Lanolin is Wool Fat with which 30 per cent. $H_2O$ is incorporated.

*What is an Enzyme?*

It is a chemical ferment with proteolytic action.

Pepsinum is an enzyme obtained from the fresh and healthy stomach of the sheep, pig, or calf. Dose 5 to 10 grains.

*Has it any Preparation, and how should it be administered?*

Glycerinum Pepsini, 10 per cent., dose 1 to 2 drams.

It should be given directly after meals and followed by a dose of hydrochloric acid, as it only acts in an acid solution, and is thus employed as a digestive adjuvant.

*What causes Milk to curdle in the Stomach?*

An enzyme "Rennin," present in the gastic juice.

*Describe Thyroideum Siccum.*

The fresh and healthy thyroid gland of the sheep, prepared by removing the fat and connective tissue from the gland, directly the sheep is killed; all cystic and hypertrophied glands are rejected, and the residue is dried, minced, and powdered, being subsequently purified by washing with petroleum spirit and drying again. The active principle is Thyroiodin which contains Iodine and Phosphorus.

*What is the Dose of Thyroid Gland and what is its Action?*

$\frac{1}{2}$ to 4 grains.

When administered internally, it greatly increases the rate of the pulse, causes palpitation, enfeebles the cardiac beat, and flushes and moistens the skin. It leads to increased oxidation of all tissues, and being excreted by kidneys, there is an excess of urea, uric acid, and phosphates in the urine.

*What is its Effect in Myxœdema?*

This is a disease in which the functions of the thyroid gland are in abeyance, or the gland may be atrophied, and on administering Thyroid Gland, all the symptoms disappear in a few weeks, but the administration must be continued during the patient's life.

*Give the Preparations obtained from the Bee (Apis mellifica).*

Mel Depuratum, Cera Alba, Cera Flava.

*Mention the Preparations obtained from the Pig (Sus scrofa).*

Adeps preparatus, Liquor Pancreatis, Pepsinum.

*What is Liquor Pancreatis, and what is its Dose and Chemical Properties?*

It is an alcoholic solution of the fresh pancreas of the pig, being most active when the animal has been fed shortly before being killed.

One to two fluid drams.

In the presence of alkalies it converts starch into sugar, albumin and fibrin into peptones. It will not act in an acid medium, nor at a temperature higher than 47° C.

*How is Milk Peptonised?*

Dilute one pint of milk, heated to 38° C, with five ounces of tepid water, and keeping it at this temperature, add two drams of Liquor Pancreatis and twenty grains of Bicarbonate of Sodium. Maintain the temperature for half-an-hour, then transfer to a cold place until required.

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## VEGETABLE MATERIA MEDICA.

*What two entire Plants are Official?*

Chiretta, which is the dried plant Swertia Chirata.

Lobelia, which is the dried flowering herb Lobelia Inflata.

*Mention a Peculiarity of Chiretta, and give its Preparations.*

It contains no tannin, and thus can be prescribed with iron.

Its preparations are—

Infusum Chiratæ, dose ½ to 1 fluid ounce.

Tinctura Chiratæ, dose ½ to 1 fluid dram.

*How would you recognise Lobelia, and what Preparation has it?*

The stems are channelled and a purple colour, with small two-celled inflated capsules containing brown seeds.

Tinctura Lobeliæ Ætherea, dose 5 to 15 minims.

*Is Lobelia a Safe Drug to use?*

No. It is a powerful gastro-intestinal irritant, often causing complete prostration; the heart is first stimulated, then soon becomes depressed, irregular, and feeble, these effects being due to paralysis of nerve ganglia.

*What is it chiefly used for?*

The tincture is used in asthma to relax the muscular coat of the bronchial tubes, but large doses must be employed and these are not to be recommended.

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# ROOTS.

## ACONITUM NAPELLUS.

*How would you recognise Aconite Root?*

Tapering, dark brown colour, marked with scars of broken rootlets, and crowned with remains of an undeveloped bud. Taste at first slight but soon followed by tingling and numbness.

*How would you distinguish it from Horseradish Root?*

Aconite is conical, shorter, and darker; taste-sensation characteristic.

*What Alkaloids are present in Aconite Root?*

Aconitine, Aconine, Benzaconine.

*Mention its Preparations, and describe its Actions on the various Systems.*

Linimentum Aconiti; Tinctura Aconiti. Dose, 2 to 5 minims.

Circulatory.—Stimulates vagus centre, steadying and

slowing the cardiac beat, and reducing the force and tension of the pulse.

Respiratory.—Respiration steadied and slowed, expiration prolonged.

Nervous.—When applied locally depresses activity of peripheral nerve endings, thus relieving pain.

Thermogenetic.—Reduces temperature by its action on the circulation and respiration, and acts as a diaphoretic.

## COCHLEARIA ARMORACIA.

*How would you recognise Official Horseradish Root?*

It must be fresh. Is a pale yellow externally, whitish internally. Taste very pungent. Inodorous unless when it is scraped.

*Has it any Preparation, and what are its Uses?*

Spiritus Armoraciæ Compositus. Dose, 1 to 2 drams. Used chiefly as a condiment, similar to mustard.

## ATROPA BELLADONNA.

*Describe the Appearance of Belladonna Root.*

Externally pale greyish-brown, internally white. Longitudinally wrinkled and branched, and may be entire or longitudinally split.

*How would you distinguish it from Scammony Root?*

Scammony is larger, shrivelled, and contorted.

*What are the chief Alkaloids of Belladonna Root?*

Atropine Hyoscyamine.

*What is the only Preparation made from the Root?*

Extractum Belladonnæ Liquidum, containing ·75 per cent. alkaloids

*Enumerate, with strengths, the Preparations of this Extract.*

Emplastrum Belladonnæ, ·25 per cent. alkaloids.
Linimentum Belladonnæ, ·375 per cent. alkaloids.
Unguentum Belladonnæ, ·6 per cent. alkaloids.
Suppositoria Belladonnæ, each containing $\frac{1}{60}$ grain alkaloids.

*On what does Belladonna depend for its Action?*

Atropine (*q.v.*).

## JATEORHIZA CALUMBA.

*Describe Calumba Root and mention its Alkaloid.*

Transversely cut, flat, circular slices, which are centrally depressed, with a wrinkled brown cork, and a thick cortex, marked with radiating lines and separated from the centre by a fine dark line.

Its alkaloid is Berberine.

*In what respect does Calumba resemble Chiretta, and what are its Preparations?*

It contains no Tannin.
Infusum Calumbæ, dose $\frac{1}{2}$ to 1 oz.
Tinctura Calumbæ, dose $\frac{1}{2}$ to 1 dram.

*Describe the Action of Calumba.*

It acts as a digestive adjuvant, by stimulating the gustatory nerves and so increasing the flow of saliva. It is a typical bitter.

## PSYCHOTRIA IPECACUANHA.

*How would you recognise Ipecacuanha Root?*

It occurs in short twisted pieces with a thick brown cortex, marked by a great number of closely applied annular ridges. The central portion is white. The cortex contains the active principles.

*Enumerate its Alkaloids.*

Emetine. Cephaeline. Psychotrine.

*Give the Official Directions regarding the Powdered Root and its Dose.*

It must be adjusted, by addition of milk sugar, till it contains 2 per cent. of alkaloids.

As an expectorant $\frac{1}{4}$ to 2 grains. As an emetic 15 to 30 grains.

*Name the Ipecacuanha Preparations containing Opium or Morphine.*

Pulvis Ipecacuanhæ Compositus (Dover's Powder), 10 per cent. opium, dose 5-15 grains.

Pilula Ipecacuanhæ cum Scillâ, 5 per cent. opium, dose 4 to 8 grains.

Pilula Ipecacuanhæ cum Urginea, 5 per cent. opium, dose 4 to 8 grains.

Trochiscus Morphinæ et Ipecacuanhæ, each contains $\frac{1}{36}$ grain Morph. Hydrochlor.

*What other Preparations are there?*

Extractum Ipecacuanhæ Liquidum, 2 per cent. alkaloids, dose $\frac{1}{2}$ to 2 mins.

Vinum Ipecacuanhæ, ·1 per cent. alkaloids, dose 10 to 30 mins., 4 to 6 drams (emetic).

Trochiscus Ipecacuanhæ.

*Describe the Alimentary Action of Ipecacuanha.*

In small doses it increases salivary flow, dilates the gastric vessels, and stimulates gastric secretion. In large doses it acts as a gastric irritant, both directly, and indirectly by stimulating the medullary vomiting centre. Its irritant effect is continued in the intestine, and diarrhœa results. It acts as a specific in amœbic dysentery, because emetine is a poison to the amœba, but it is better to inject, intramuscularly, small doses of emetine hydrochloride, than to

give large does of powdered ipecacuanha, as the latter cannot always be tolerated.

*What is its Effect on the Respiratory System?*

Respiration is unaffected, but if enough is taken it is excreted by the bronchial mucous membrane, causing increased secretion of bronchial mucus and so stimulating a reflex cough.

*Which Preparation of Ipecacuanha acts as a Diaphoretic?*

Dover's Powder (Pulv. Ipecac. Co.), dose 5 to 15 grains.

## IPOMŒA PURGA.

*What are the Physical Characters of Jalap and its chief Constituent?*

Irregularly oblong or ovoid, hard tubercles about the size of a pigeon's egg.

Dark brown and furrowed externally; dirty yellow internally.

Jalap resin, of which it should contain 9 to 11 per cent. (*vide* RESINS).

*Give the Dose of Jalap and name its Preparations.*

5 to 20 grains.

Its preparations are—

Pulvis Jalapæ Compositus, dose 10 to 60 grains.
Tinctura Jalapæ, dose ½ to 1 dram.
Tinctura Jalapæ Composita, dose ½ to 1 dram.
Pulvis Scammonii Compositus, dose 10 to 20 grains.

*What is peculiar about the Simple Tincture and the Active Principle of the Resin?*

It is standardised to contain 1·5 per cent. of the resin.
The active principle is a glucoside called Convolvulin.

## IPOMŒA TURPETHUM.

*What Part of Turpeth is used and what Preparation contains it?*

The dried root and stem.
It is found in Tinctura Jalapæ Composita.

*Mention its Actions.*

Similar to Jalap and due to a glucoside resembling Convolvulin.

## CONVOLVULUS SCAMMONIA.

*Describe Scammony Root.*

Externally it is greyish brown; internally, pale grey or white. It is cylindrical in shape, enlarged at the upper end, bearing remains of aerial stems. Shrivelled, contorted and longitudinally furrowed.

*What other Root resembles it?*

Belladonna (*q.v.*).

## IPOMŒA ORIZABENSIS.

*Are there other Names for Ipomœa Root?*

Orizaba Jalap Root. Mexican Scammony Root.

*What is the Source of Scammony Resin and its Active Principle?*

Ipomœa or Scammony roots.
Jalapin, which is a glucoside, dose ½ grain.

*Describe the Action of Scammony and Jalap Roots?*

They are drastic purgatives, requiring bile for their action (*vide* Resins).

## KRAMERIA ARGENTEA VEL TRIANDRA.

*What is Rhatany Root?*

The dried root of Krameria argentea = Para Rhatany, or the dried root of Krameria triandra = Peruvian Rhatany.

*Describe the Appearance and Character of each.*

Para Rhatany is purplish brown with smooth, thick bark, which is closely adherent to the wood, and has deep cracks.

Peruvian Rhatany is dark reddish-brown, with rough thin bark which is loosely adherent to the wood and is scaly.

Both are astringent to taste, and tinge the saliva red.

*What is the Composition and Action of Rhatany?*

Rhatanhia-tannic acid 20 per cent. Rhatanhia red.
Powerfully astringent due to tannic acid.

*Enumerate the Preparations.*

Extractum Krameriæ, dose 5 to 15 grains.
Infusum Krameriæ, dose $\frac{1}{2}$ to 1 ounce.
Pulvis Catechu Compositus, dose 10 to 60 grains.
Tinctura Krameriæ, dose $\frac{1}{2}$ to 1 dram.
Trochiscus Krameriæ, each contains 1 grain of extract.
Trochischus Krameriæ et Cocainæ each contains $\frac{1}{20}$ grain Cocain. Hyd.

## GLYCYRRHIZA GLABRA.

*What is Liquorice Root?*

It is the peeled root and peeled subterranean stem of Glycyrrhiza Glabra.

*What other Roots resemble it?*

Pyrethrum and Taraxacum which taste bitter.

*Give the Chief Constituents and the Preparations of Liquorice.*

Glycyrrhizin and Asparagin. Its preparations are—Extractum Glycyrrhizæ. Extractum Glycyrrhizæ Liquidum. Pulvis Glycyrrhizæ Compositus, dose 60 to 120 grains.

*What are the Uses of Liquorice?*

It is an excellent demulcent for coughs, a mild aperient, and helps to cloak the unpleasant taste of many nauseous drugs.

## ANACYCLUS PYRETHRUM.

*What is the other Name of Pyrethrum Root and what Root does it resemble?*

Pellitory Root.

It resembles Taraxacum which is darker and has not a burning taste.

*Name the Preparation of Pellitory Root and give its Actions.*

Tinctura Pyrethri, which has no dose.

It is a powerful sialagogue, causing a burning sensation in the mouth followed by numbness.

## POLYGALA SENEGA.

*Describe Senega Root.*

It is found in irregular pieces with knobs; from the knobs irregular twisted pieces pass, about the thickness of a quill; on the opposite side from the twist (*i.e.*, on the concavity) there is a linear projection or KEEL, looking as if a piece of string had been placed under the bark and drawn tight.

*Which other Roots resemble Senega?*

Serpentary, which has a camphoraceous odour, and no keel. Valerian, which has a disagreeable odour, and no keel.

*What is the Composition of Senega Root?*

Saponin, which is a glucoside. Polygalic Acid.

*What other Plant contains Saponin?*

Quillaia bark. (*vide* Digitalis Leaves).

*State the Preparations of Senega and give its Action.*

Infusum Senegæ, dose ½ to 1 ounce.
Tinctura Senegæ, dose ½ to 1 dram.

In small doses it is liable to derange the stomach, owing to the irritant action of Saponin, and it is this irritant action which causes reflexly an increase of bronchial secretion and a tendency to cough. It is thus a stimulating expectorant. When administered by the mouth very little is absorbed.

*When is its Use contra-indicated?*

In bronchitis during the early stage; in phthisis, and when the stomach is deranged.

## TARAXACUM OFFICINALE.

*Describe Dandelion Root.*

The fresh root, which is official, is externally smooth and light brown; internally white and a milky juice exudes. It exhibits a yellow, porous, woody axis with concentric rings. No odour. Taste bitter.

*What are its Preparations and Action?*

Extractum Taraxaci, dose 5 to 15 grains.
Succus Taraxaci, dose 1 to 2 drams.
It is a simple bitter and acts like Calumba Root (q.v.)

## RHIZOMES.

*What is Couch Grass?*

It is the dried rhizome, freed from leaves and rootlets, of Agropyrum Repens, known officially as Agropyrum.

*Mention its Preparations and Uses.*

Decoctum Agropyri, dose ½ to 2 ounces.

Extractum Agropyri Liquidum, dose 1 to 2 drams.

It is used chiefly in the colonies as a demulcent and diuretic, being often administered as a urinary sedative in cystitis and gonorrhœa.

*What is Male Fern and its Official Preparation?*

It is the dried rhizome of Dryopteris Filix-mas, divested of its leaves, roots, and all dead portions.

Its official preparation is Extractum Filicis Liquidum, known as "Oil of Male Fern," and prepared by percolation with ether, which is subsequently evaporated, leaving an oily liquid. Dose 45 to 90 minims.

*Is this Preparation standardised?*

Yes. It must contain, at least, 20 per cent. of filicin, the active principle.

*What are its Uses and how is it administered?*

It is a certain anthelmintic for tapeworm.

The bowels should first be emptied by a mild purge, then the drug is administered. After twelve hours a saline purgative is given to clear away the dead worm.

*Why is a Saline Purgative given?*

Because Castor Oil is a solvent of filicic acid, which, when dissolved, is liable to be absorbed and to give rise to severe toxic symptoms.

*Which other Drugs are used for Tapeworm?*

Pelletierina Tannas. Cusso. Cucurbita Semina Præparata.

*What is Yellow Jasmine? Give its Active Principles and Preparation.*

The dried root and rhizome of Gelsemium Nitidum.

Gelsemine, and Gelseminine.

Tinctura Gelsemii, dose 5 to 15 minims.

*Give its Actions and Uses.*

It is a powerful depressant of the motor cells of the cord, causing paralysis; it also depresses the heart. It causes disturbance of vision by paralysing the ocular muscles, and the pupil is dilated.

It has been used in neuralgia and migraine, but being uncertain in action, it is rarely prescribed.

*What Part of Gentian is Official and what are its Preparations and Actions?*

The dried rhizome and root of Gentiana Lutea.
Extractum Gentianæ, dose 2 to 8 grains.
Infusum Gentianæ Compositum, dose ½ to 1 ounce.
Tinctura Gentianæ Composita, dose ½ to 1 dram.

*What are its Actions?*

It is similar in action to Calumba (q.v.).

*What is Golden Seal?*

It is the dried rhizome and roots of Hydrastis Canadensis.

It is irregularly twisted, showing the scars of decayed stems on its upper surface, and when a root is broken off from the lower surface a bright yellow or golden spot remains; hence "Golden Seal."

*Mention its Active Principles.*

Hydrastine, Canadine, Berberine.

*What other Rhizome contains Berberine?*

Podophyllum.

*State the Preparations of Hydrastis.*

Extractum Hydrastis Liquidum, dose 5 to 15 minims.
Tinctura Hydrastis, dose ½ to 1 dram.

*Describe its Actions and Uses.*

In small doses it acts as a gastric bitter. Moderate doses stimulate the medullary centres, thus slowing the heart, contracting the arterioles, and raising blood pressure. It is reputed to cause contraction of the uterus by direct action on its muscle.

It is used externally as a stimulating application to chronic ulcers, and as a lotion to prevent excessive perspiration. It is administered internally for chronic inflamed mucous membranes, uterine hæmorrhage, dysmenorrhœa, and menorrhagia.

*What is Picrorhiza and what are its Preparations and Uses?*

The dried rhizome of Picrorhiza Kurroa, dose 10 to 20 grains.

Extractum Picrorhizæ Liquidum, dose 15 to 60 minims.

Tinctura Picrorhizæ, dose ½ to 1 dram.

It is employed in the colonies as a gastric bitter and antiperiodic.

*What Varieties of Podophyllum are Official?*

The dried rhizome and roots of Podophyllum Peltatum.

The dried rhizome and roots of Podophyllum Emodi.

*How would you recognise it?*

Dark reddish-brown pieces of variable lengths, enlarged at nearly equal intervals, the upper surface of enlargement being marked by a depressed circular scar, below which is a number of very brittle, brownish rootlets.

*What are the Active Principles?*

Berberine and the official resin.

*What other Rhizome contains Berberine?*

Hydrastis.

*Mention the Preparations of each Variety of Podophyllum.*

Tinctura Podophylli, dose 5 to 15 minims.
Tinctura Podophylli Indici, dose 5 to 15 mimims.

*State the Actions of Podophyllum.*

It stimulates the intestinal muscle, increases intestinal secretions and the flow of bile, and so acts as a purgative, taking about ten hours to act, causing griping, and motions deeply stained with bile. The griping is prevented by combining it with hyoscyamus.

*What is the Official Rhubarb and how is it recognised?*

The dried rhizome, partly deprived of its coat, of Rheum Officinale.

Irregular pieces, the surfaces being often coloured with a yellow brown powder, and the pieces often bored with a hole which may contain a piece of string used to suspend whilst drying it.

*Name its Active Principles and give its Dose.*

Chrysarobin, Chrysophanic Acid, Rheo-tannic Acid, Oxalate of Lime.

For repeated administration, 3 to 10 grains.
As a single administration, 15 to 30 grains.

*What are its Preparations?*

Extractum Rhei, dose 2 to 8 grains.
Infusum Rhei, dose ½ to 1 ounce.
Pil. Rhei Composita, dose 4 to 8 grains.
Pulvis Rhei Compositus, dose 10 to 60 grains.
Syrupus Rhei, dose ½ to 2 drams.
Tinctura Rhei Composita, dose ½ to 1 dram.

*Describe its Actions and Uses.*

It acts as a gastric bitter, in small doses. In large doses it causes purgation, producing in about six hours a liquid

motion stained yellow by Chrysarobin. Purgation is usually followed by constipation, due to Rheo-tannic Acid. The colouring matter is excreted by the urine, staining it yellow when acid, and red when alkaline. It is used as a tonic, a stomachic purgative, and in diarrhœa due to gastric irritation.

*What is Serpentary and what are its Preparation and Action?*

It is the dried rhizome and roots of Aristolochia Serpentaria.
Tinctura Serpentariæ, ½ to 1 dram.
It is a bitter stomachic.

*Which Varieties of Valerian are Official?*

The dried rhizome and roots of Valeriana Officinalis.
The dried rhizome and roots of Valeriana Wallichii.

*Give its Preparations, Actions, and Uses.*

Each has an Ammoniated Tincture, dose ½ to 1 dram.
It acts as an aromatic bitter, and is excreted by bronchi and kidneys.
It is used to relieve neuralgia, and has been given with marked benefit in hysteria.

*What is Ginger? Mention its Preparations and Uses.*

The scraped and dried rhizome of Zingiber Officinale.
Syrupus Zingiberis, ½ to 1 dram. Tinctura Zingiberis, ½ to 1 dram.
Stomachic, Carminative, Flavouring agent.

## SEEDS.

*What Varieties of Almonds are Official?*

(1) Sweet Almond; the ripe seed of Prunus Amygdalus, var, dulcis.
(2) Bitter Almond; the ripe seed of Prunus Amygdalus, var. amara.

*How are they distinguished?*

(1) The "Sweet" are flattened, elongated, and lanceolate; taste pleasant.

(2) The "Bitter" are broader, shorter, and coarser in appearance; taste bitter. When bruised with water, they emit an odour like "Ratafia" (from production of prussic acid).

*Describe their Composition.*

Both contain about 50 per cent. of a FIXED OIL (the ordinary "almond oil"); also EMULSIN, a ferment. The Bitter contains, in addition, 2 to 3 per cent. of a glucoside called AMYGDALIN: this in the presence of water, and under the influence of EMULSIN, produces a VOLATILE OIL, the "essential oil of bitter almonds." This oil is poisonous, as it contains from 4 to 8 per cent. of "prussic acid." This reaction besides producing "prussic acid" also produces glucose, and benzoic aldehyde or hydride of benzol; this in turn easily absorbs oxygen, and becomes benzoic acid. The oil when purified by the separation of "prussic acid" is not poisonous, and is used for flavouring sweets. The artificial oil of bitter almonds, "Nitro-benzene," or "Nitro-benzol," is poisonous, though it has much the same flavour as the purified natural oil.

*State their Preparations and Uses.*

Oleum Amygdalæ, obtained from either variety.

Pulvis Amygdalæ Compositus, from sweet almonds.

Mistura Amygdalæ, made from the preceding, dose ½ to 1 ounce.

Sweet almonds are demulcent and nutritive, and as they contain no starch, they are made into flour for making biscuits for diabetic patients.

*What Preparations contain Almond Oil?*

Linimentum Ammoniæ: Oleum Phosphoratum.

Unguentum Aquæ Rosæ.

*What are Butea Seeds? Give their Official Preparation and Uses.*

The seeds of Butea Frondosa.

Pulvis Buteæ Seminum, which is prepared by soaking the seeds in distilled water, carefully removing the integuments, and drying and powdering the kernels, dose 10 to 20 grains.

A full dose is given daily for three successive days as an anthelmintic for roundworms.

*What are Cardamoms?*

The dried ripe seeds of Elettaria Cardamomum, preserved in their pericarps until required for use.

*Why are they thus preserved?*

To prevent adulteration and loss of volatile oil.

*Name the Official Preparation and give its Uses.*

Tinctura Cardamomi Composita, dose ½ to 1 dram. The tincture is contained in Decoctum Aloes Comp. and Mistura Sennæ Comp.

It is carminative and stomachic and is used as a colouring agent.

*What parts of Colchicum are used, and what are its Active Principles?*

The dried ripe seeds and the fresh corm of Colchicum Autumnale.

Two alkaloids, viz., Colchicine and Veratrine.

*Mention the Preparations.*

From the corm—Extractum Colchici, dose ¼ to 1 grain. Vinum Colchici, dose 10 to 30 minims.

From the seeds—Tinctura Colchici, 5 to 15 minims.

*What are its Actions and Uses?*

It is a gastro-intestinal irritant and a direct cholagogue,

depresses the heart, and if given in large doses causes general prostration.

It is used to relieve gout, being given between the attacks to diminish their severity, but if symptoms of gastric or intestinal irritation are evident its use is contra-indicated.

*Describe Melon Pumpkin Seeds and give their Dose and Use.*

Fresh ripe seeds of Cucurbita Maxima. *N.B.* When used they must not be more than a month old, dose 3 to 4 ounces.

They are used as an anthelmintic for tapeworm. They should be given in the early morning on an empty stomach, followed in one hour by a hot drink, three hours later by a dose of castor oil, and two hours after this by a substantial meal.

*What are Datura Seeds? Mention their Preparation.*

The dried seeds of Datura fastuosa. Tinctura Daturæ Seminum, dose 5 to 15 minims.

*What other Part of this Plant is Official?*

The dried leaves.

*What are its Uses?*

Used chiefly in the colonies to relieve asthma.

*Describe Cotton Wool and mention Preparations made from it.*

The hairs of the seeds of Gossypium Herbaceum, from which fatty matter has been removed.

Pyroxylinum or Dinitro cellulose, and from this Collodium and Collodium Vesicans are obtained.

*What is* (1) *Linseed and* (2) *Spogel Seeds?*

(1) The dried ripe seeds of flax—Linum Usitatissimum.
(2) The dried seeds of Plantago Ovata, dose 45 to 150 grains.

*Mention the Uses of these Two Seeds.*

As they contain much mucilage they are infused to make demulcent drinks. Externally they are applied as poultices in inflammation.

*Describe a Nutmeg.*

It is the dried kernel of the seed of Myristica Fragrans, which contains from 2 to 8% of the official volatile oil.

*What is Nux Vomica and its Active Principles?*

The dried ripe seeds of Strychnos nux-vomica, dose 1 to 4 grains. When powdered the seeds must be adjusted to contain 1.25% Strychnine.
Strychnine, Brucine, Igasuric Acid, Loganin.

*State the Preparations, their Strength and Dose.*

Extractum Nucis Vomicæ Liquidum, 1.5% Strychnine, dose 1 to 3 min.
Extractum Nucis Vomicæ Siccum, 5% Strychnine, dose $\frac{1}{4}$ to 1 grain.
Tinctura Nucis Vomicæ, .125% Strychnine, dose 5 to 15 min.

(For actions *vide* Strychnine.)

*What is Staves acre, its Active Principle, and Uses?*

The dried ripe seeds of Delphinium Staphisagria.
Delphine. An alkaloid acting like Aconitine.
It is used in the form of the official ointment—Unguentum Staphisagriæ—and also as a parasiticide for pediculi.

*What Part of Strophanthus is Official? Give the Preparations.*

The dried ripe seeds of Strophanthus kombé, freed from awns.

Extractum Strophanthi, dose ¼ to 1 grain.

Tinctura Strophanthi, dose 5 to 15 minims.

*Describe its Action on the Circulation.*

On the HEART. It prolongs diastole, but does not shorten systole; it strengthens the force and causes cardiac regularity, acting similarly to Digitalis (q.v.).

On the VESSELS. It does not constrict the peripheral vessels, thus acting differently from Digitalis. There is a slow rise of blood pressure, which is due almost entirely to cardiac action. It is not cumulative.

## RIPE FRUITS.

*What Part of the Orange is Official?*

(1) The *fresh* outer part of the pericarp of Citrus Aurantium.

(2) The *dried* outer part of the pericarp of Citrus Aurantium.

*Mention the Preparations.*

From the fresh peel—Tinctura Aurantii, dose ½ to 1 dram.

From the fresh peel—Vinum Aurantii.

From the dried peel—Infusum Aurantii Compositum, dose ½ to 1 ounce.

From the dried peel—Infusum Aurantii, dose ½ to 1 ounce.

*What is Orange Flower Water, and what Preparation has it?*

A saturated solution of the volatile oil, prepared by distillation from the flowers of Citrus Aurantium, dose ½ to 1 ounce.

Syrupus Aurantii Floris, dose ½ to 1 dram.

*Which Part of the Lemon is Official, and what are its Preparations?*

The fresh outer part of the pericarp of Citrus medica.
Syrupus Limonis, dose ½ to 1 dram.
Tinctura Limonis, dose ½ to 1 dram.

*How is Oil of Lemons obtained?*

By excoriation and expression from fresh lemon peel.

*What is Lemon Juice, and what Acids does it contain?*

The freshly expressed juice of the ripe fruit of Citrus medica.
Citric, malic, and phosphoric acids.

*Describe* (1) *Dill Fruit*, (2) *Anise*, (3) *Caraway*, (4) *Fennel.*

Anethi Fructus, the dried ripe fruit of Peucedanum Graveolens; used for obtaining Aqua Anethi and Oleum Anethi.

Anisi Fructus, the dried ripe fruit of Pimpinella Anisum, used for obtaining Aqua Anisi and Oleum Anisi.

Carui Fructus, the dried ripe fruit of Carum Carvi, used for obtaining Aqua Carui and Oleum Carui.

Foeniculi Fructus, the dried ripe fruit of Foeniculum Vulgare, used for obtaining Aqua Foeniculi.

*How would you distinguish these Four Fruits?*

(1) Dill fruit has separate mericarps, is not attached to pedicle, and its lateral dorsal ridges are prolonged to form wings.

(2) Anise has mericarps united and attached to a common pedicle, but is not winged.

(3) Caraway has separate mericarps, slightly curved and tapering towards each end, glabrous, and shows five small longitudinal ridges.

(4) Fennel is smooth, greenish-brown, capped by a stylopod and two styles, and easily separated into its two mericarps.

*Describe Coriander Fruit.*

The dried ripe fruit of Coriandrum Sativum, used for obtaining the official Oleum Coriandri.

*What is Capsicum?*

The dried ripe fruit of Capsicum minimum, used for obtaining Tinctura Capsici, dose 5 to 15 mins., and Unguentum Capsici.

*What are Embelia Berries?*

The dried fruit of Embelia Ribes and Embelia Robusta, used in the form of a powder or infusion as an anthelmintic for tapeworm.

*Which Fruits are used as Purgatives?*

Cassiæ Fructus, the ripe fruits of Cassia Fistula.

Sennæ Fructus, the ripe fruits of Cassia acutifolia and Cassia angustifolia.

Tamarindus, the fruit of Tamarindus indica, preserved with sugar.

## UNRIPE FRUITS.

*Name those Official.*

1. Bael Fruit, the fresh, half-ripe fruit of Ægle Marmelos.
2. Myrobalans, the dried, unripe fruits of Terminalia Chebula.
3. Cubebs, the dried, unripe, full-grown fruit of Piper Cubeba.

*What are the Preparations of Cubebs, their Actions and Uses?*

Oleum Cubebæ, dose 5 to 20 minims.

Tinctura Cubebæ, dose ½ to 1 dram.

Small doses are stomachic and carminative. They increase the bronchial secretion, disinfecting it also, and stimulate the entire genito-urinary tract, being excreted by the urine.

Used in the form of lozenges and cigarettes for bronchitis and chronic pharyngitis, and in the form of capsules, containing the volatile oil, for gonorrhœa, gleet, and chronic cystitis.

## BULBS.

*What Bulbs are Official?*

1. Squill, the inner, dried, and sliced scales of Urginea scilla.
2. Indian Squill, the inner, dried, and sliced scales of Urginea indica.

*How would you distinguish between Squill and Tragacanth?*

Squill is yellowish-white, opaque, tough, and flexible.
Tragacanth is greyish-white, translucent, thin, and brittle.

*Name the Preparations of Squill?*

Acetum Scillæ, dose 5 to 15 minims.
Oxymel Scillæ, dose ½ to 1 dram.
Syrupus Scillæ, dose ½ to 1 dram.
Pilula Ipecacuanhæ cum Scilla (5 per cent. opium), dose 4 to 8 grains.
Pilula Scillæ Composita, dose 4 to 8 grains.
Tinctura Scillæ, dose 5 to 15 minims.
(Indian Squill has similar preparations.)

*Give the Dose of Squill and describe its Actions and Uses.*

Dose 1 to 3 grains.
It is diuretic and a cardiac tonic, increases bronchial secretion, and aids mucus expectoration. In cardiac dropsy it is given in combination with Digitalis and Mercury, in pill form (known as Bailey's pill). It should not be prescribed as an expectorant in chronic bronchitis or phthisis, as its irritant qualities may exert themselves.

## PULPS.

*Which Pulps are Official?*

Cassia Pulp and Colocynth Pulp.

*What is Cassia Pulp and its Action?*

It has the consistence of a soft extract and is obtained by crushing the pods of Cassia Fistula, percolating with water and evaporating.

As a laxative. It is contained in Confectio Sennæ.

*Describe Colocynth Pulp and mention its Preparations, Actions, and Uses.*

The dried pulp of the fruit of Citrullus colocynthis, freed from seeds, and popularly known as "Bitter Apple."

Extractum Colocynthidis Compositum, dose 2 to 8 grains.

Pilula Colocynthidis Composita, dose 4 to 8 grains.

It increases the flow of bile and intestinal secretions, stimulating the intestinal muscle, and causing watery evacuations. It is a drastic cathartic, and may produce great depression. It should never be given alone as it gripes greatly, but with Hyoscyamus. It is used solely as a purgative, sometimes in Ascites and Bright's disease.

## LEAVES.

*Describe Belladonna Leaves.*

They are collected when the plant is in flower, are broadly ovate, acute and entire; light-green above, dusky-green beneath, and slightly wrinkled. They must yield not less than ·3 per cent. alkaloids.

*Name the Alkaloids present.*

Hyoscyamine and Atropine (q.v.).

*What Leaves resemble Belladonna, and how would you distinguish them?*

Hyoscyamus leaves, which are mostly sessile, hairy beneath, and always with attached flowers.

Stramonium leaves, which are dentated, unequal at the base, and minutely wrinkled.

*Give the Preparations of Belladonna Leaves.*

Extractum Belladonnæ Siccum, 1 per cent. alkaloids, dose ¼ to 1 grain.

Tinctura Belladonnæ, ·035 per cent. alkaloids, dose 5 to 15 minims.

*Mention the Source of Hyoscyamus Leaves and their Alkaloids and Preparations.*

From the flowering plants of Hyoscyamus niger.

Their alkaloids are Hyoscyamine and Hyoscine, and their preparations—

Extractum Hyoscyami, ·3 per cent. alkaloids, dose 2 to 8 grains.

Tinctura Hyoscyami, dose ½ to 1 dram.

*Compare the Actions of Hyoscyamus and Belladonna.*

Hyoscyamus is a cerebral and spinal sedative. Belladonna is a deliriant. Hyoscyamus is a more powerful intestinal stimulant, increasing the peristaltic contractions to a greater extent, and when combined with other purgatives, relieves griping.

Hyoscyamus has a more marked sedative action on the bladder.

*Describe the Uses of Hyoscyamus.*

To relieve vesical spasm in cystitis, calculus, and prostatitis. To prevent the griping of purgatives. (*Vide* Hyoscyamine Sulphate.)

*What are Stramonium Leaves, their Alkaloids and Official Preparations?*

The dried leaves of Datura Stramonium. Their alkaloids are Hyoscyamine, Atropine, Daturine.

Their only official preparation is Tinctura Stramonii, dose 5 to 15 minims.

*Describe the Actions and Uses of Stramonium.*

It acts similarly to Belladonna, but relaxes the muscular coat of the bronchial tubes more powerfully, thus relieving spasm. It is chiefly used in asthma, in the form of cigarettes and smoking mixtures.

*What are Betel Leaves?*

The dried leaves of the Piper Betel, used chiefly in India along with other aromatic substances as a chewing gum.

*Describe Buchu Leaves.*

The dried leaves of Barosma Betulina. They are of a dull yellowish-green colour, marked at the margins of the under surface with small dots, which are oil glands; margin dentate, aromatic odour.

*What Leaves resemble them?*

Senna leaves, which are entire, unequal at base, and have no oil glands. Bearberry leaves, which are entire, very astringent, and have no oil glands.

*Mention the Preparations of Buchu, and their Actions and Uses.*

Infusum Buchu, dose 1 to 2 ounces.

Tinctura Buchu, dose ½ to 1 dram.

Being excreted by the kidneys, they act as diuretics, at the same time having an astringent and disinfectant effect on the urinary tract. They are used in cystitis, gonorrhœa, and pyelitis.

*What are Foxglove Leaves?*

The dried leaves of Digitalis Purpurea, dose ½ to 2 grains.

*Describe the Active Principles of Digitalis Leaves.*

1. Digitoxin, a glucoside, very irritant, poisonous and cumulative.
2. Digitalin, a glucoside, less powerful than the preceding.
3. Digitonin, a saponin, cardiac depressant, and gastric irritant.
4. Digitophyllin, a glucoside.
5. Digitalein, a soluble glucoside, is non-cumulative.
6. Digitin, an inert glucoside.

(*N.B.*—Digitalis leaves contain no alkaloids.)

*Name the Official Preparations and their Cardiac Action.*

Infusum Digitalis, dose 2 to 4 drams.

Tinctura Digitalis, dose 5 to 15 minims.

The cardiac terminations of the vagi are stimulated, thus slowing the beat; the cardiac muscle is stimulated, thus increasing the force; at the same time diastole is prolonged, and cardiac irregularity is abolished.

*What other Actions has Digitalis?*

By its direct action on the muscular coats of the arterioles, stimulation of the medullary and spinal vaso-motor centres, combined with the increased cardiac force, there is a great rise in blood pressure. There is relaxation of renal arterioles, with consequent increase of arterial glomerular pressure, leading to diuresis.

*Describe its Various Uses.*

In Mitral regurgitation, to strengthen, regulate, and slow the beat.

In Mitral constriction, to lengthen diastole, and so allow a greater amount of blood to pass through the constricted orifice.

In Hæmoptysis, due to mitral disease.

In Cardiac dropsy as a diuretic.

*When should its Administration be avoided?*

When the cardiac muscle is degenerated or diseased.

In Bright's disease with a high-tension pulse.

In pure cardiac hypertrophy.

*What is Grindelia and its Official Preparation?*

The dried leaves and flowing tops of Grindelia camporum.

The official preparation is Extractum Grindeliæ Liquidum, dose 10 to 20 minims.

*Describe its Actions and Uses.*

It relaxes the bronchial muscular coat, and acts as an expectorant.

It is used in asthma, when it should be given in milk, to prevent excess precipitation of the resin.

*Which parts of Witch-hazel are Official, and what are its Preparations?*

The fresh or dried leaves of Hamamelis Virginiana.

The dried bark of Hamamelis Virginiana.

From the leaves:—

Extractum Hamamelidis Liquidum, dose 5 to 15 mins.
Liquor Hamamelidis, dose ½ to 3 drams.
Unquentum Hamamelidis.

From the bark:—

Tinctura Hamamelidis, dose ½ to 1 dram.

*Describe the Actions and Uses of Witch-hazel.*

On account of its Tannic Acid, it is astringent and hæmostatic, being used, in a diluted form, in cases of hæmorrhage, or as an astringent for bruises, pharyngitis, and nasal catarrh.

*What are Cherry Laurel Leaves and their Chief Constituents?*

The fresh leaves of Prunus Laurocerasus.

Emulsin. Laurocerasin, identical with Amygdalin, which in the presence of $H_2O$ forms Prussic Acid (*vide* Almonds).

*Mention the Preparation and Use of Cherry Laurel Leaves.*

Aqua Laurocerasi, ·1 per cent. Prussic Acid, dose ½ to 2 drams.

They are used chiefly as a flavouring agent.

*What are Bearberry Leaves? Give the Official Preparation and its Actions and Uses.*

The dried leaves of Arctostaphylos Uva-ursi.

Infusum Uvæ Ursi, dose ½ to 1 ounce.

Diuretic, being astringent and disinfectant to urinary mucous membrane. Used chiefly in cystitis, pyelitis, and gonorrhœa.

*What Varieties of Senna Leaves are Official, and their Active Principles?*

Dried leaflets of Cassia Acutifolia and Cassia Angustifolia.

Their active principles are Cathartic Acid, Sennacrol, Sennapicrin, Chrysophanic Acid.

(*N.B.*—These are all glucosides.)

*Name the Preparations.*

Confectio Sennæ, dose 60 to 120 grains.

Infusum Sennæ, dose ½ to 2 ounces.

Pulvis Glycyrrhizæ Compositus, dose 60 to 120 grains.

Syrupus Sennæ, dose ½ to 2 drams.

Tinctura Sennæ Composita, dose ½ to 1 dram.

(Mistura Sennæ Composita contains Infusum Sennæ.)

*State their Actions and Uses.*

They stimulate the muscular coat of the colon, acting, in about eight hours, as a purgative, this is probably due to Cathartic Acid.

They are used chiefly for their purgative action, and are best combined with some aromatic substance to lessen or prevent griping.

## PETALS.

*What are the Official Petals?*

1. Red Poppy Petals. The fresh petals of Papaver Rhœas.

2. Red Rose Petals. The fresh or dried unexpanded petals of Rosa Gallica.

*Give the Official Preparation and Dose of Red Poppy Petals and its Use.*

Syrupus Rhœados, dose ½ to 1 dram.
It is used chiefly as a colouring agent.

*What are the Preparations of Rose Petals?*

Dried Petals—Infusum Rosæ Acidum, dose ½ to 1 ounce.
Syrupus Rosæ, dose ½ to 1 dram.
Fresh Petals—Confectio Rosæ Gallicæ.
Oleum Rosæ, from petals of Rosa Damascena.

*Describe Rose Water.*

It is a saturated solution of the oil, obtained by distillation from the flowers of Rosa Damascena.

## FLOWERS.

*What are Chamomile Flowers?*

The dried expanded flower heads of Anthemis Nobilis, used as a source of the official volatile oil—Oleum Anthemidis.

*What are Cloves?*

Dried unexpanded flower buds of Eugenia Caryophyllata, used as a source of Oleum Caryophylli, and for making Infusum Caryophylli, dose ½ to 1 ounce.

*Describe Cusso, and give its Dose and Method of Administration.*

The dried panicles of pistillate flowers of Brayera Anthelmintica, dose 120 to 240 grains.

The desired quantity, in coarse powder, is mixed with half a pint of warm water, allowed to stand fifteen minutes, then stirred up but not strained, and taken in two or three draughts at short intervals. It is best taken in the morning fasting (a purgative being administered the night preceding),

and should be followed in six hours by a brisk cathartic. It is specific for tapeworm.

*What are Arnica Flowers, and their Official Preparation?*

The dried flower-heads of Arnica Montana.

Their official preparation is Tinctura Arnicæ Florum, dose ½ to 1 dram.

## PLANT TOPS.

*What is Indian Hemp?*

Cannabis Indica. The dried flowering or fruiting tops of the pistillate plant of Cannabis Sativa, from which the resin has not been removed.

*What are its Preparations?*

Extractum Cannabis Indicæ, dose ¼ to 1 grain.

Tinctura Cannabis Indicæ (made from Extract), dose 5 to 15 mins.

*How would you prescribe the Tincture?*

Mucilage must be employed to suspend the excessive amount of resin which the addition of water causes.

*What are its Chief Actions and Uses?*

It chiefly affects the convolutions, producing a kind of intoxication. Pleasing hallucinations, rapid flow of mental ideas, so that a lifetime seems to be compressed into a few minutes. The person seems to have *two* existences, himself and someone else, a kind of *double* consciousness. He can assume remarkable postures and movements—cataleptic and rhythmical, *salaaming* convulsions. There are also delusions as to space and time.

It is given to relieve pain, and as a soporific in delirium tremens; also in insanity. It is said to have all the good effects of opium and none of its disadvantages.

*Name its Special Advantages as compared with Opium.*

1. Sleep is profound and refreshing.
2. An absence of constipation and sickness.
3. It does not derange the stomach nor kidneys.
4. The head remains quite clear.

*What are Broom Tops?*

Scoparii Cacumina. The fresh and dried tops Cytisus Scoparius.

*Mention the Chief Constituents.*

1. Scoparin, a neutral principle, which acts directly on the renal epithelium, and is thus a diuretic.

2. Sparteine, a liquid oily alkaloid, which slightly increases the force of the heart like digitalis, and paralyses peripheral nerve endings.

*Name the Preparations of Broom and their Uses.*

Infusum Scoparii, from the dried tops, dose 1 to 2 ounces
Succus Scoparii, from the fresh tops, dose 1 to 2 drams.
Combined with other diuretics, they are used in cases of cardiac dropsy. They should not be prescribed in acute renal cases.

## BARKS.

*What is Acacia Bark?*

Acaciæ Cortex. The dried bark of Acacia Arabica and of Acacia Decurrens, not less than seven years old, and when dried, must be kept one year before using.

*Mention its Preparation and its Use.*

Decoctum Acaciæ Corticis, dose $\frac{1}{2}$ to 2 ounces.
As it contains much tannin, it is used as an astringent in stomatitis, pharyngitis, and vaginitis.

*What is Alstonia? Give its Preparations, Action, and Uses.*

The dried bark of Alstonia Scholaris and Alstonia Constricta.

Infusum Alstoniæ, dose ½ to 1 ounce.

Tinctura Alstoniæ, dose ½ to 1 dram.

It appears to paralyse motor nerve endings. It is used, chiefly in the Colonies, for dysentery and intermittent fever.

*What is "Sacred Bark"?*

Cascara Sagrada. The dried bark of Rhamnus Purshianus.

*Name its Preparations, Actions, and Uses.*

Extractum Cascaræ Sagradæ Siccum, dose 2 to 8 grains.

Extractum Cascaræ Sagradæ Liquidum, dose ½ to 1 dram.

Syrupus Cascaræ Aromaticus contains the Liquid Extract.

It is a stomachic and simple laxative, which causes little griping. It is very serviceable for chronic constipation, a gradually-increased dosage not being required.

*What is Cascarillæ Cortex?*

The dried bark of Croton Eluteria. It is in the form of quills, covered with a silvery-white lichen.

*Name its Preparations and their Uses.*

Infusum Cascarillæ, dose ½ to 1 ounce.

Tinctura Cascarillæ, dose ½ to 1 dram.

They are aromatic bitter stomachics.

*What is Cinchonæ Cortex?*

The dried bark of the stem and branches of Cinchona Succirubra.

*Name the Chief Alkaloids.*

Quinine, Quinidine, Cinchonine, Cinchonidine.

(*N.B.*—Quinine may be obtained from any variety of Cinchona, but only Red Cinchona Bark is official.)

*What are the Preparations of Cinchona?*

Extractum Cinchonæ Liquidum, 5 per cent. alkaloids, dose, 5 to 15 mins.

Infusum Cinchonæ Acidum, dose ½ to 1 ounce.

Tinctura Cinchonæ, 1 per cent. alkaloids, dose ½ to 1 dram.

Tinctura Cinchonæ Composita, ·5 per cent. alkaloids, dose ½ to 1 dram.

*What is Cinnamomi Cortex? Name its Preparations and their Uses.*

The dried inner bark from truncated stocks of Cinnamomum Zeylanicum.

Aqua Cinnamomi, dose 1 to 2 ounces.

Pulvis Cinnamomi Compositus, dose 10 to 60 grains.

Tinctura Cinnamomi, dose ½ to 1 dram.

Oleum Cinnamomi, dose ½ to 3 minims.

Aromatic stomachic, and astringent.

*What is Euonymi Cortex?*

The dried root-bark of Euonymus Atropurpureus.

*Describe Euonymin and give its Actions and Uses.*

It is Extractum Euonymi, dose 1 to 2 grains.

It stimulates the flow of gastric juice, and is an indirect cholagogue.

Used as a purgative in constipation with disordered liver.

*What is Cotton Root Bark?*

Gossypii Radicis Cortex. Dried root bark of Gossypium Herbaceum.

*Name its Preparations and their Uses.*

Decoctum Gossypii Radicis Corticis, dose ½ to 2 ounces.

Extractum Gossypii Radicis Corticis Liquidum, dose ½ to 1 dram.

They are chiefly employed in the colonies as uterine hæmostatics.

*Describe Virginian Prune Bark and mention its Active Principles.*

The bark of the wild cherry, Prunus Serotina. Its active principles are Amygdalin and Emulsin (*vide* Almonds).

*What are its Preparations, Action, and Use?*

Syrupus Pruni Virginianæ, dose ½ to 1 dram.

Tinctura Pruni Virginianæ, dose ½ to 1 dram.

Owing to the formation of Prussic Acid by its constituents, it lessens reflex bronchial excitability, and is thus employed to relieve a hacking cough by which nothing is expectorated.

*What is Soap Bark? Give its Chief Constituent.*

The dried inner part of the bark of the tree, Quillaja Saponaria.

Saponin, which forms a frothy solution in water.

*Which other Drug contains Saponin?*

Senega.

*Describe Black Haw, and mention its Preparation and Uses.*

The dried bark of Viburnum Prunifolium.

Extractum Viburni Liquidum, dose 1 to 2 drams.

It is sedative in dysmenorrhœa and menorrhagia, and is used to control hæmorrhage during the menopause.

## WOODS.

*What is Lignum Vitæ?*

Guaiaci Lignum. The heart-wood of Guaiacum Officinale. In dark green, dense, hard pieces, which sink in water. It is used as a source of the official, Guaiaci Resina (*q.v.*).

*Describe Logwood, and give its Preparation and Uses.*

Hæmatoxyli Lignum. The heart-wood of Hæmatoxylon Campechianum. In hard, heavy pieces, purple-red externally, reddish-brown internally.

Its preparation is Decoctum Hæmatoxyli, dose ½ to 2 ounces.

As it contains much tannin, it is used as a powerful astringent, and to control all forms of diarrhœa.

*What is Red Sanders-wood?*

Pterocarpi Lignum. The heart-wood of Pterocarpus Santalinus. It is used as a colouring agent in Tinctura Lavandulæ Composita.

*What other Wood is used as a Colouring Agent?*

Sappan. The heart-wood of Cæsalpinia Sappan.

*Describe Quassia, and mention its Preparations, Actions, and Uses.*

The wood of the trunk and branches of Picræna Excelsa.

Infusum Quassiæ, dose ½ to 1 ounce.

Tinctura Quassiæ, dose ½ to 1 dram.

It is an aromatic stomachic, very bitter, contains no tannin, and can thus be prescribed with iron preparations.

The infusion is often injected, per rectum, for thread-worms.

## VEGETABLE PRODUCTS.

*What is Starch? Name its Official Preparation.*

Amylum. The product from grains of wheat, Triticum Sativum; from maize, Zea Mays; from rice, Oryza Sativa.

Glycerinum Amyli.

*Describe Goa Powder and its Use.*

Araroba. A substance found in cavities in the trunk of Andira Araroba, freed from wood fragments, dried, and powdered.

It is used for making Chrysarobin, which is extracted from it by hot benzene.

*What Preparation has Chrysarobin? Give its Use.*

Unguentum Chrysarobini.

It is used as an antiparasitic for ringworm, and in psoriasis.

*Name the Official Varieties of Catechu?*

Catechu Pallidum, an extract from leaves and young shoots of Uncaria Gambier, dose 5 to 15 grains.

Catechu Nigrum, an extract from the wood of Acacia Catechu, dose 5 to 15 grains.

*State the Preparations of Pale Catechu and its Use.*

Pulvis Catechu Compositus, dose 10 to 60 grains.

Tinctura Catechu, dose ½ to 1 dram.

Trochiscus Catechu, 1 grain in each.

In virtue of its tannic acid, it is a powerful astringent, and is used for cases of Pharyngitis and Diarrhœa.

*What is Ergot?*

It is a fungus. The sclerotium or spawn of Claviceps Purpureum, originating in the ovary of Secale Cereale, the common rye.

*Give its Dose and Composition.*

15 to 60 grains. It is composed of (1) Ergotoxin, a very active amorphous alkaloid; (2) Ergotinine, an inert alkaloid; (3) Tyramine, possessing powerful physiological properties, acting in a similar manner to Adrenalin; (4) Iminazolylethylamine, a powerful substance, acting directly on the uterus; (5) A fixed oil; (6) Saponin; (7) Tannin.

*Name its Preparations.*

Extractum Ergotæ, or Ergotin, dose 2 to 8 grains.

Extractum Ergotæ Liquidum, dose 10 to 30 minims.

Infusum Ergotæ, dose 1 to 2 ounces.

Tinctura Ergotæ Ammoniata, dose ½ to 1 dram.

*What is Injectio Ergotæ Hypodermica?*

It is an aqueous solution of 33 per cent. of Extractum Ergotæ, containing 1 per cent. Carbolic Acid as a preservative.

*What is the best Method of administering Ergot?*

Many believe in giving the powdered drug, as the solubility and stability of its constituents are very variable.

*State its Actions and Uses.*

Circulatory.—There is general arterial contraction, due to direct action of the drug on the muscular coats and nerve terminals of the vessels, the arteries becoming smaller, and if the drug is administered for a lengthened period, the arteriolar contraction is accompanied by thickening of the muscular coat of the arterioles, so that obstruction of circulation follows, and gangrene occurs. The heart muscle is directly excited, and this, in conjunction with its arteriolar action, causes a rise in blood pressure.

Nervous.—After prolonged use, a sensation of epidermal itching and tingling is experienced, soon followed by numbness and local anæsthesia, tonic muscular contractions, dimness of vision, loss of hearing, and epileptiform convulsions. These symptoms constitute "Ergotism."

Generative System.—Powerfully excites contraction of the uterine muscle, with expulsion of contents, but has very little, if any, power on the unimpregnated uterus.

The chief use of Ergot is for post-partum hæmorrhage, by causing efficient contraction of the uterus after labour. It is used also as a hæmostatic in hæmoptysis and various hæmorrhages.

*What are Galls? Mention their Composition and Preparations.*

Excrescences on Quercus infectoria, caused by the puncture and deposit of the eggs of Cynips gallæ tinctoriæ.

Tannic Acid, 75 per cent. Gallic Acid, 5 per cent.

Unguentum Gallæ and Unguentum Gallæ cum Opio (7·5 per cent. opium). They are used also as a source of Tannic Acid.

# CHEMICAL MATERIA MEDICA.

## ARSENIC.

*What is "White Arsenic"?*

Acidum Arseniosum; obtained by roasting arsenical ores and purifying the product by sublimation.

*In what Forms does it exist?*

1. A heavy white crystalline powder.
2. Stratified, opaque, white, amorphous masses.

*Give its Dose and Preparations.*

$\frac{1}{64}$ to $\frac{1}{10}$ grain.

Liquor Arsenicalis (Fowler's solution), 1 per cent., dose 2 to 8 minims.

Liquor Arsenici Hyrochlorieus, 1 per cent., dose 2 to 8 minims.

*Why are there two Liquors?*

Fowler's solution (coloured red with Compound Tincture of Lavender) is an alkaline solution, and could not be prescribed with acid solutions. The other liquor is acid.

*What are the Official Salts of Arsenic?*

Sodii Arsenas Anhydrosus, dose $\frac{1}{40}$ to $\frac{1}{10}$ grain.

Arsenii Iodidum, dose $\frac{1}{20}$ to $\frac{1}{3}$ grain.

*How is the Sodium Salt obtained?*

By fusing white arsenic, sodium nitrate, and sodium carbonate, treating the fused mass with water, then driving off the water by exposing to a temperature of 150° F.

*Why is Nitrate of Sodium used?*

To form nitric acid which oxidises the Arsenious to Arsenic Acid; otherwise an Arsenite would be formed.

*What Preparation has Sodium Arsenate?*

Liquor Sodii Arsenatis, 1 per cent., dose 2 to 8 minims.

*How is Arsenii Iodidum obtained? What is its Colour, Preparation, and Dose?*

By the direct union of Iodine and Arsenic.

It is orange in colour, and its preparation is Liquor Arsenii et Hydrargyri Iodidi (Donovan's Solution), 1 per cent., dose 5 to 20 minims.

*What is Peculiar about the Dose?*

The maximum dose would contain $\frac{1}{5}$ grain of Red Iodide of Mercury, the official dose of which is $\frac{1}{32}$ to $\frac{1}{16}$ grain.

*Mention the External Action and Uses of Arsenious Acid.*

It is a caustic, and is used to destroy new growths, and to destroy the sensitive pulp of carious teeth, previous to stopping them.

*How is it used as a Caustic?*

In the form of a paste with some inert substance. If the paste is dilute, much arsenic may be absorbed, but if strong, the arsenic destroys the tissues and so prevents absorption.

*Describe its Internal Actions and Uses.*

Alimentary System.—It is excreted by the gastric mucous membrane, and in small doses acts as a gastric stimulant, but in excessive doses as a severe gastric irritant.

Circulatory System.—It is a slight cardiac stimulant, and is quickly absorbed into the blood, and in diseases in which the red corpuscles and hæmoglobin are diminished, it increases both.

General Effects.—During its excretion by the various tissues it influences metabolism by being converted into arsenic acid by protoplasm, and reconverted by venous blood

to arsenious acid. The fatty product of this change is retained in the tissues.

It is used to stimulate the appetite in some forms of dyspepsia, and should be given in small doses, always after meals It has been proved valuable in chronic skin diseases not owing their origin to an irritant.

It is beneficial in all cases of primary anæmia, and has been used with success in rheumatoid arthritis.

In chorea, when accompanied by anæmia and cardiac trouble, it undoubtedly does good.

*What Conditions modify the Dose of Arsenic?*

It is modified by—

1. Age.—Relatively, children can take more than adults. Above five years the adult dose may be given; and from eight to puberty the dose may be larger than the adult dose.

2. Sex.—Female children and adolescents can take more than male.

3. Habit.—The Styrians eat arsenic to the extent of several grains per day, and thrive on it. They are mountaineers, and it is said to give them increased muscular energy, improves nutrition and colour, and increases the respiratory capacity, so that they can pursue their work with greater ease, and with less muscular energy and waste. It probably does so because it lessens the secretion of carbonic acid, and muscle waste is also lessened.

4. Idiosyncrasy.—Some persons can only take the very smallest dose of arsenic without producing toxic effects.

*What are the Signs of Overdose?*

Epigastric fulness, pain, and tenderness, a sense of constriction in the throat, irritation of the eyes and œdema of the eyelids, twitching of the eyes and face, and silvery fur upon the tongue; occasionally there may be vomiting. These signs indicate that the full physiological effect of the drug has been reached.

## ANTIMONY.

*Name the Official Salts of Antimony.*

Antimonium Sulphuratum, dose 1 to 2 grains.

Antimonii Oxidum, dose 1 to 2 grains.

Antimonium Tartaratum, dose $\frac{1}{25}$ to $\frac{1}{8}$; (emetic) $\frac{1}{2}$ to 1 grain.

*How is Sulphurated Antimony obtained?*

By boiling the native sulphide with sublimed sulphur and a solution of caustic soda (this gives oxide of antimony and sulphide of sodium), and then treating the product with $H_2SO_4$, which precipitates the sulphide and a little oxide of antimony, leaving sulphate of sodium in solution.

*What is Sulphurated Antimony, and what Preparation contains it?*

It is a mixture of sulphides and oxides of antimony. It is used in Plummer's Pill—Pilula Hydrargyri Subchloridi Composita.

*How is the Oxide prepared? Name its Preparation.*

Pour a solution of antimonious chloride into water. This will precipitate the oxychloride, which is then treated with sodium carbonate to remove the chlorine, and the oxide remains.

Pulvis Antimonialis, dose 3 to 6 grains.

*Describe Tartar Emetic, and give its Official Preparation.*

Antimonium Tartaratum, a double tartrate of antimony and potassium, obtained by making an aqueous paste of oxide of antimony and cream of tartar, allowing it to stand for twenty-four hours, boiling in water, evaporating, and crystallising. Vinum Antimoniale, dose 10 to 30 minims; and if used as an emetic, dose 2 to 4 drams.

*How would you distinguish between these Three Salts?*

Antimonium Sulphuratum is a dull red powder.

Antimonii Oxidum is a greyish white powder.

Antimonium Tartaratum is a colourless crystalline powder.

*What are their Actions and Uses?*

They are powerful depressants, diminishing the force and frequency of the cardiac impulse, weakening respiration, and causing a feeling of langour, inapitude for mental exertion, and sleepiness. They are excreted by (1) the bronchial mucous membrane, acting as depressing expectorants; (2) by the skin, acting as diaphoretics; (3) by the bile, acting as cholagogues; (4) by the kidneys, acting as diuretics. Tartar Emetic induces vomiting, firstly by its direct effect on the gastric mucosa; secondly, after absorption, by stimulation of the medullary vomiting centre, but its use as an emetic is not to be recommended owing to its slowness of action and its depressant effects.

Antimonial salts are used as depressants in the early stages of acute inflammatory diseases, as expectorants in the early stages of acute bronchitis, and, combined with opium, as sedatives in delirium tremens.

## PHOSPHORUS.

*What is the Source of this Non-metal?*

Calcium Phosphate is treated with $H_2SO_4$, filtered and evaporated; the product is then heated with charcoal and distilled.

*Give the Dose of Phosphorus, and mention the Preparations containing Free Phosphorus.*

$\frac{1}{100}$ to $\frac{1}{25}$ grain.

1. Oleum Phosphoratum, a true 1 per cent. solution of phosphorus in almond oil, which must first be heated to expel air, then filtered to remove water and organic matter, which would oxidise the phosphorus. A little oil of lemon is added to conceal the nauseous taste. Dose 1 to 5 minims,

2. Pilula Phosphori, containing 1 per cent. phosphorus, dose 1 to 4 grains.

*What is Red or Amorphous Phosphorus?*

It is the product formed by heating official phosphorus with hydrogen; being very insoluble, it is regarded as non-poisonous, owing to its not being capable of absorption by the tissues.

*Describe the Action and Use of Phosphorus.*

The spongy tissue of bones is thickened by deposition of true bone, and the compact tissue is rendered more dense. Large and repeated doses produce fatty degeneration of the liver and muscles. It has been used in osteomalacia, rickets, and in cases of ununited fracture, but its therapeutic effects are limited and disappointing.

*How is it excreted?*

It enters the blood as phosphorus (not as phosphoric acid), and is excreted in the urine as phosphates.

*How does Phosphorus produce Fatty Degeneration?*

By preventing the complete oxidation of glycogen, fat, and the non-nitrogenous products of metabolism.

*What other Drugs act in a similar Manner?*

Arsenic and antimony.

## POTASSIUM.

*Is this Metal Official? Give, with Doses, its Official Salts.*

No.

| | |
|---|---|
| Potassii Bichromas | $\frac{1}{10}$ to $\frac{1}{3}$ grain. |
| Potassii Permanganas | 1 to 3 grains. |
| Potassii Chloras | 5 to 15 grains. |
| Potassii Carbonas | 5 to 20 grains. |
| Potassii Nitras | 5 to 20 grains. |
| Potassii Iodidum | 5 to 20 grains. |
| Potassii Bicarbonas | 5 to 30 grains. |
| Potassii Bromidum | 5 to 30 grains. |
| Potassii Sulphas | 15 to 45 grains. |
| Potassii Tartras Acidus | 15 to 60 grains. |
| Potassii Acetas | 15 to 60 grains. |
| Potassii Citras | 15 to 60 grains. |
| Potassii Tartras | 30 to 240 grains. |
| Potassa Sulphurata<br>Potassa Caustica | No dose. |

## POTASSII CARBONAS.

*What other Name has this Salt, and how is it obtained?*

Salt of Tartar.

By the interaction of Potassium Sulphate and Calcium Carbonate.

*Mention the Official Preparations containing it.*

1. Liquor Arsenicalis (as a solvent of arsenic).
2. Decoctum Aloes Compositum (to dissolve the resin).
3. Mistura Ferri Composita (to form carbonate of iron).

*What are its Uses?*

As a soothing wash in skin diseases. It must be applied very diluted, and not allowed to evaporate, as, when concentrated, it would act as an irritant.

*Which Salts of Potassium are obtained from the Carbonate?*

1. Potassii Bicarbonas.
2. Potassii Bichromas.
3. Potassii Bromidum.
4. Potassii Acetas.
5. Potassii Citras.
6. Potassii Tartras.
7. Potassa Sulphurata
8. Potassa Caustica.

## POTASSII BICARBONAS.

*How is this Salt obtained?*

By passing carbonic anhydride gas through a strong aqueous solution of Potassium Carbonate, and allowing the Bicarbonate to crystallise out.

*How does it differ, in Properties, from the Carbonate?*

It is less soluble and not deliquescent.

*Describe its Actions and Uses.*

It inhibits excessive secretion of the gastric juice, and is given after meals in cases of acid dyspepsia. It causes diuresis and renders the urine less acid, being administered in gout to assist the excretion of uric acid.

## POTASSII ACETAS.

*How is it prepared, and how would you recognise it?*

By saturating acetic acid with potassium carbonate, evaporating and fusing the product.

It is very deliquescent, and has an odour of vinegar.

*What are its Actions and Uses?*

Is a neutral salt, and has no action on the gastric juice. It enters the blood as a carbonate, stimulates the renal cells, acting as a powerful diuretic, decreasing the amount of solids in the urine, and rendering it alkaline. On account of its urinary action it is used in rheumatic and gouty disorders, Bright's disease, ascites, etc.

*How would you prescribe it as a Diuretic?*

℞

Potassii Acetatis ʒ iv.
Spiritus Ætheris Nitrosi ʒ vi.
Succi Scoparii ʒ̄ iss.
Aq. Chloroformi ad ʒ vi. ℿ

Capiat cochleare magnum quartis horis.

## POTASSII CITRAS.

*How is it obtained?*

By neutralising a solution of citric acid with potassium carbonate.

*What are its Actions and Uses?*

Similar, in every respect, to the acetate.

## POTASSII SULPHAS.

*How is this prepared? Name the Preparations containing it.*

By the interaction of sulphuric acid and potassium chloride.

1. Pilula Colocynthidis Composita.
2. Pilula Colocynthidis et Hyoscyami.
3. Pulvis Ipecacuanhæ Compositus.
4. Pilula Ipecacuanhæ cum Scilla.

*Why is it employed for these Preparations?*

On account of its hardness, for triturating tough vegetable products, and also as a diluent.

## POTASSII TARTRAS.

*How is this Salt prepared?*

By neutralising excess of acid in Cream of Tartar with carbonate of potassium.

## POTASSII TARTRAS ACIDUS.

*How is this obtained?*

By purification, with chalk and clay, of "Argol," which is the crude tartar deposited in wine casks during fermentation of grape juice.

*Why is it called "Cream of Tartar"?*

Because the purest crystals are "skimmed" off during evaporation.

*What preparations contain it?*

1. Confectio Sulphuris.
2. Trochiscus Sulphuris.
3. Pulvis Jalapæ Compositus.

*Describe the Actions of the Sulphate, Tartrate, and Acid Tartrate of Potassium.*

They all act as saline purgatives and diuretics. When given in large doses, not much diluted, the specific gravity of the contents of the stomach is increased above that of the blood, and by a process of osmosis, serum is effused into the stomach, and a cathartic action is thus produced. If, on the other hand, small, well diluted doses are given, absorption takes place, and the salt, being converted into a carbonate, is conveyed by the blood as such to the kidneys, where it is eliminated and produces diuresis. These salts

are used in dropsy and uræmia as purgatives, and are then best combined with some vegetable purgative, *e.g.* Jalap, so as to increase peristalsis, otherwise they might be re-absorbed. Also used in cases of gall-stones, especially the sulphate which acts as a cholagogue.

## POTASSII NITRAS.

*What other Names has this Salt, and how is it obtained?*

Nitre and Saltpetre.

It is obtained by the action of Sodium Nitrate and Potassium Chloride.

*State its Actions and Uses.*

It is a gastric irritant, and liable to cause vomiting. It is a cardiac depressant. Small doses are diuretic, acting directly on the renal cells, but large doses are liable to cause hæmaturia. It is also a mild diaphoretic. Its chief use is for the treatment of asthma, blotting paper being soaked in a strong solution of the salt, and, when dried, lighted, and the fumes inhaled. It is a common ingredient of asthma powders.

## POTASSII CHLORAS.

*How is this prepared?*

Pass Chlorine into water holding lime or magnesium in suspension, treat the liquid with Potassium Chloride, and crystallise the Potassium Chlorate.

*What are its Characters? Name its Preparation.*

Colourless, monoclinic crystals; easily explodes on trituration with sulphur, sugar, tannin, charcoal, or glycerine.

Trochiscus Potassii Chloratis. 3 grains in each.

*On what does its Actions depend?*

It yields its oxygen very readily, and on this account its therapeutic action in stomatitis, pharyngitis, and tonsillitis is always local.

*What is its Effect on the Blood?*

Small doses have no effect, but in large doses the red corpuscles are disintegrated, the hæmoglobin becomes converted into methæmoglobin; it is excreted by the urine which is dark and contains granular debris. There may also be hæmatemesis.

## POTASSII BICHROMAS.

*Describe the Preparation of this Salt.*

By roasting chrome ironstone with lime in the presence of air, and treating the resulting chromate with a potassium salt, then with an acid.

*How would you recognise it?*

Orange-red transparent crystals.

*What other Salts of Potassium are coloured?*

Potassii Permanganas, purple. Potassii Sulphurata, greenish.

*How should the Bichromate be prescribed, and what are its Uses?*

As it oxidises readily and forms explosive compounds, it is best prescribed in capsules, or in pills with kaolin.

It is given on an empty stomach for gastric ulcer.

It is used as a source of Chromic Acid.

## POTASSII PERMANGANAS.

*How is this obtained, and what is its Preparation?*

By the interaction of Potassium Chlorate, Potassium Hydroxide, and Manganese Dioxide.

Liquor Potassii Permanganatis, 1 per cent, dose 2 to 4 drams.

*On what does it depend for its Action?*

When moist it readily parts with its oxygen, and, on this account, it is used as a disinfectant, deodorizer, and antiseptic.

# MATERIA MEDICA.

## PART II.

## CHEMICAL MATERIA MEDICA—*continued.*

### POTASSA CAUSTICA.

*Describe its Source, and name its Preparation.*

By the interaction of Potassium Carbonate and slaked lime. Liquor Potassa contains 5 per cent, dose 10 to 30 minims.

*Explain its Caustic Action.*

It absorbs water from the tissues, passing deeply into them, being very diffusive and painful. Its caustic action may be neutralized by the application of vinegar.

*What are some of its Uses?*

1. In strong solutions it is an escharotic, and dissolves tissues.

2. In weak solutions it is antacid, and soothes the gastric mucous membrane.

3. It makes the urine alkaline, and is therefore used to dissolve uric acid deposits.

4. It is used in strangury to sooth the genito-urinary mucous membrane; also in gonorrhœa, etc.

5. As a soothing wash in some skin diseases—*e.g.* erythema.

6. Also used because it has, in a well-marked degree, the general features of alkalies.

7. It is said to remove obesity.

8. To lessen the viscidity of secretions, as in chronic bronchitis.

## POTASSA SULPHURATA.

*Mention its Mode of Preparation and its other Name.*

By heating a mixture of sulphur and potassium carbonate. It is also known as Liver of Sulphur.

*What are its Uses?*

Externally as an ointment for chronic skin diseases, and as a bath (4 ounces to 30 gallons) for chronic psoriasis.

## POTASSII BROMIDUM.

*How is this Salt prepared?*

By the interaction of ferrous bromide with potassium carbonate.

(For actions see Bromides.)

## POTASSII IODIDUM.

*How is it obtained?*

Dissolve iodine in liquor potassæ, and evaporate the solution to dryness; the residue is a mixture of iodate and iodide. Heat the residue to redness with a little charcoal, this unites with the oxygen of the iodate, forming carbonic oxide, and reducing the iodate to iodide. Dissolve in water, filter, wash, and evaporate.

*What are its Preparations?*

Linimentum Potassii Iodidi cum Sapone.
Unguentum Potassii Iodidi.
Is also contained, as a solvent, in all iodine preparations.

(For actions see Iodine.)

## SODIUM.

*Is this Official? Enumerate, with Doses, the Official Salts.*

| No. | | |
|---|---|---|
| 1. | Sodii Arsenas Anhydrosus | $\frac{1}{10}$ to $\frac{1}{10}$ grain. |
| 2. | Sodii Nitris | $\frac{1}{2}$ to 2 grains. |
| 3. | Sodii Hypophosphis | 3 to 10 grains. |
| 4. | Sodii Carbonas Exsiccatus | 3 to 10 grains. |
| 5. | Sodii Biboras | 5 to 15 grains. |
| 6. | Sodii Iodidum | 5 to 20 grains. |
| 7. | Sodii Sulphis | 5 to 20 grains. |
| 8. | Sodii Carbonas | 5 to 30 grains. |
| 9. | Sodii Bicarbonas | 5 to 30 grains. |
| 10. | Sodii Bromidum | 5 to 30 grains. |
| 11. | Sodii Benzoas | 5 to 30 grains. |
| 12. | Sodii Salicylas | 10 to 30 grains. |
| 13. | Sodii Phosphas Acidus | 30 to 60 grains. |
| 14. | Sodii Phosphas | 30 to 240 grains. |
| 15. | Sodii Sulphas | 30 to 240 grains. |
| 16. | Sodii et Potassii Tartras | 120 to 240 grains. |
| 17. | Sodii Chloridum | *ad libitum.* |

### SODII CARBONAS.

*How is this prepared, and what are its other Names?*

By the interaction of sodium chloride with ammonium bicarbonate, ignition, and subsequent crystallization.

Soda and washing soda.

### SODII CARBONAS EXSICCATUS.

*How is it obtained, and what is its Advantage?*

By heating the carbonate until the crystals fall to powder; there is about 63 per cent of weight lost.

Its advantage is that it is a salt of **constant strength**.

*What are the Actions of these two Salts?*

Similar to the corresponding potassium preparation, but less caustic.

## SODII BICARBONAS.

*Describe its Source, and give its Common Name.*

Pass $CO_2$ through a strong aqueous solution of the carbonate, and let the salt crystallize out (*vide* Potassium Bicarbonas.)

Baking soda.

*What are its Uses?*

A lotion of 10 grains to 1 ounce water is used as a sedative to relieve itching. Its internal action is similar to the corresponding potassium salt, but it is not depressant, and is more slowly absorbed. It is often prescribed with carbonate of bismuth to relieve dyspepsia. Large doses are useful for diabetic coma, as they neutralize the excess of acids in the blood; as much as two ounces being given for this purpose.

## SODII PHOSPHAS.

*Mention its Source and Official Preparation.*

Make a solution of acid phosphate of calcium by digesting "bone ash" in sulphuric acid. Filter the solution and add carbonate of sodium till the solution is alkaline.

Sodii Phosphas Effervescens, dose 60 to 240 grains.

## SODII SULPHAS.

*How is this prepared, and what is its Common Name and Preparation?*

By the interaction of common salt with sulphuric acid.

Glauber's salts.

Sodii Sulphas Effervescens, dose 60 to 240 grains.

## SODII ET POTASSII TARTRAS.

*What other Names has this Salt, and how is it prepared?*

Rochelle salt and tartarated soda.

By neutralising cream of tartar with sodium carbonate.

*What is a "Seidlitz Powder"?*

It is a packet consisting of an alkaline powder in blue paper, and an acid powder in white paper. The blue paper contains a mixture of Rochelle salt, 120 grains, and sodium bicarbonate, 40 grains; the white paper contains 38 grains of tartaric acid.

*Enumerate the Purgative Salts of Sodium.*

1. Sodii Phosphas and its effervescent preparation.
2. Sodii Sulphas and its effervescent preparation.
3. Sodii et Potassii Tartras and its effervescent preparation.

*What other Effervescent Preparation of Sodium is there?*

Sodii Citro-tartras Effervescens, dose 60 to 120 grains.

*How do these act as Purgatives?*

In a similar manner to the purgative potassium salts, but, being more slowly absorbed, they pass on into the intestine, and there exert a more efficient action than the potassium salts.

*What are their Uses?*

As purgatives for habitual constipation and gouty constipation. As cholagogues, the phosphate and sulphate being used. In cases of gall-stones the sulphate has proved beneficial.

## SODII CHLORIDUM.

*State the Actions and Uses of "Common Salt"?*

1. As an article of diet, it replaces the sodium chloride of the blood-plasma which has been used in tissue metabolism.
2. In large quantities it withdraws fluid from the gastro-intestinal mucous membrane, acts as an irritant, and induces vomiting.
3. Rectal injections are used as an anthelmintic for thread-worms.

4. One teaspoonful dissolved in a pint of cooled boiled water forms a normal saline solution, which, when injected in cases of collapse due to loss of blood or other fluid, acts as a restorative.

## SODII SULPHIS.

*How is this prepared?*

By saturating a solution of sodium carbonate with sulphurous acid gas.

*What are its Uses?*

In the stomach it is decomposed by acids, and gives off sulphurous anhydride, which, acting as an antiseptic, arrests fermentation. Externally it is used as a mild antiparasitic.

## SODIUM ACID PHOSPHATE.

*What is this Salt?*

It is phosphate of sodium in which one atom of sodium is replaced by one atom of hydrogen.

*Does it exist in the Body? Mention its Use.*

Yes. It is the cause of the natural acidity of the urine. It is administered in conjunction with hexamine in cases where the urine is alkaline from cystitis.

## SODII BROMIDUM.

*How is this prepared?*

By the interaction of ferrous bromide with sodium carbonate, (for action *vide* BROMIDES).

## SODII IODIDUM.

*How is this obtained?*

In a similar way as the potassium salt, substituting the sodium for the potassium elements (for action *vide* IODIDES).

## SODII HYPOPHOSPHIS.

*How is this obtained, and what is it used for?*

By adding sodium carbonate to a solution of calcium hypophosphite and evaporating. It is used as a tonic in phthisis.

## SODII ARSENAS ANHYDROSUS.

*Describe its Source, Preparation, and Action.*

Fuse together arsenious anhydride, sodium carbonate and sodium nitrate; dissolve the fused product in water and crystallise; this forms crystallised sodium arsenate, which when exposed to a temperature of 150° forms Anhydrous Arsenate of Sodium. Its preparation is Liquor Sodii Arsenatis, 1 per cent, dose, 2 to 8 minims. It depends for its action solely on the Arsenic (*q.v.*).

## SODII NITRIS.

*How is this prepared, and what is its Action?*

By fusing sodium nitrate with lead, the latter extracts oxygen from the nitrate and converts it into a nitrite. Its action is similar, but slower, to the other nitrites (*q.v.*).

## SODII BENZOAS.

*How is this Salt obtained, and on what does it depend for its Action?*

By neutralising a solution of Benzoic acid with sodium carbonate. It depends for its Action on the Benzoic radicle (*vide* Benzoic acid).

## SODII SALICYLAS.

*State the Source, Actions, and Uses.*

By acting on sodium carbonate with salicylic acid.

1. It is antipyretic, causing a slight increase of perspiration.
2. It increases the solids and the amount of bile.

3. It is administered in rheumatic fever, the micro-organism of which forms formic acid, but the salicylate counteracts this formation (*vide* ACID SALICYLIC).

## SODII BIBORAS.

*What is the common Name of this Salt? Give its Source and Preparations.*

Borax. It is produced by neutralising boric acid with sodium carbonate. Its preparations are, Glycerinum Boracis; Mel Boracis.

*Describe its Uses.*

1. Astringent and sedative to mucous membranes.
2. Antiseptic and disinfectant in stomatitis and ulcerated throats.
3. In epilepsy, combined with bromides.
4. As a food preservative.

*Contrast the Actions of Sodium Salts with Potassium Salts.*

1. Sodium salts are more slowly absorbed.
2. Sodium salts are less diffusible.
3. Sodium salts are weak diuretics.
4. Sodium salts, as expectorants, increase the liquefaction of sputum to a greater extent, and facilitate its expulsion.
5. Sodium salts are poor solvents of Uric acid.

## AMMONIUM SALTS.

*Enumerate, with Doses, the Official Salts.*

1. Ammonii Carbonas, dose 3 to 10 grains.
2. Ammonii Chloridum, dose 5 to 20 grains.
3. Ammonii Benzoas, dose 5 to 15 grains.
4. Ammonii Bromidum, dose 5 to 30 grains.

*What is the Source of the Carbonate?*

Obtained by heating a mixture of Ammonium Chloride and Calcium Carbonate, when the Ammonium Carbonate will rise as a vapour and become condensed.

*Is it a Pure Salt?*

No; it is a variable compound composed of the Acid Carbonate of Ammonium with Carbamate of Ammonium.

*What is the Official Preparation?*

Spiritus Ammoniæ Aromaticus (Spt. of Sal Volatile), dose 20 to 90 minims.

*Describe the Actions of the Carbonate.*

In small doses it acts as a stomachic, and reflexly stimulates the heart.

It is supposed to diminish the liability of the blood to clot.

It stimulates the vaso-motor centre, causing contraction of the arterioles, with subsequent *rise of blood-pressure.*

It stimulates the medullary respiratory centre, acting as a *stimulating expectorant.*

It is converted into Urea by the liver, and excreted as such by the kidneys.

In large doses it acts as a *direct emetic.*

## AMMONII CHLORIDUM.

*How is this prepared? Give its Actions and Uses.*

By neutralising a crude solution of Ammonia with Hydrochloric Acid.

As an inhalation, it increases secretion of mucus in Pharyngitis, Laryngitis and Bronchitis.

It is administered internally in Neuralgia, Hepatic biliousness, and pains of the Uterus and Ovaries.

## (1) AMMONII BENZOAS. (2) AMMONII BROMIDUM.

*How are these Salts obtained?*

(1) By neutralising Benzoic Acid with Ammonia and evaporating (for action *vide* Acid Benzoic).

(2) By neutralising Hydrobromic Acid with Ammonia and crystallising (for actions *vide* Bromides).

## LITHIUM.

*What are the Official Salts of this Metal?*

1. Lithii Carbonas, obtained from native silicates of Lithium, dose 2 to 5 grains.
2. Lithii Citras, obtained by neutralising the preceding with Citric Acid, dose 5 to 10 grains.

*Name the Preparation of the Citrate.*

Lithii Citras Effervescens, dose 60 to 120 grains.

*Mention the Actions and Uses of these Salts.*

They are converted into chlorides in the stomach, and are excreted by the urine, which is rendered alkaline, and increased in quantity. They have been administered in Chronic Gout, and Uric Acid Calculus, but to benefit the former they must be given in large doses, and are thus liable to irritate the alimentary tract.

The Citrate is most frequently used because it is soluble 1 in 2 of water; the Carbonate is soluble 1 in 80 of water.

## CALCIUM.

*Enumerate, with Doses, the Official Salts.*

| | |
|---|---|
| Calx Sulphurata | ¼ to 1 grain. |
| Calcii Hypophosphis | 3 to 10 grains. |
| Calcii Chloridum | 5 to 15 grains. |
| Calcii Phosphas | 5 to 15 grains. |
| Calcii Lactas | 10 to 30 grains. |
| Calcii Carbonas Præcipitatus | 10 to 60 grains. |
| Creta Præparata | 15 to 60 grains. |
| Calx<br>Calcii Hydras<br>Calx Chlorinata | No dose. |

### CRETA PRÆPARATA.

*What is this Salt? Give, with Doses, its Preparations.*

It is natural Calcium Carbonate, freed from most of its

impurities by elutriation, and drying, and known as "Prepared Chalk."

1. Hydrargyrum cum Cretâ, dose 1 to 5 grains.
2. Mistura Cretæ, dose ½ to 1 ounce.
3. Pulvis Cretæ Aromaticus, dose 10 to 60 grains.

## CALCII CARBONAS PRÆCIPITATUS.

*Describe this Salt, the Preparation containing it, and its Actions and Uses.*

It is another form of Chalk, prepared by boiling together solutions of Calcium Chloride and Sodium Carbonate; known as "Precipitated Chalk."

It is one of the ingredients in Trochiscus Bismuthi Compositus.

It is Antacid, and used in Acid Dyspepsia.

It is astringent, and used in Diarrhœa.

It is used as the basis of tooth powders. Being very insoluble, it is liable to form concretions in the intestines.

## CALX.

*What is the other Name, and what is its Source and Use?*

Calcium Oxide.

Obtained by calcining Chalk, thus driving off the $CO_2$.

It is used in the preparation of—

## CALCII HYDRAS.

*How is this prepared? Give its other Names.*

By the interaction of Water and Calx.

It is also known as Calcium Hydroxide and "Slaked Lime."

*What are its Preparations, Actions, and Uses?*

1. Liquor Calcis, dose 1 to 4 ounces.
2. Liquor Calcis Saccharatus, dose 20 to 60 minims.

Externally it is Caustic, but Liquor Calcis is astringent.

Internally it is Antacid, mildly astringent, and allays vomiting.

It is used, mixed with Caustic Potash, to form "Vienna Paste," which is applied externally to destroy warts.

In the form of Liquor Calcis it prevents the formation of curds in the stomach, and for this purpose is mixed with the milk.

It is used as an injection for leucorrhœa, gleet, and thread-worms.

## CALCII PHOSPHAS.

*Mention its Source and Use.*

By the interaction of Calcium Chloride with Sodium Phosphate and excess of Ammonia at a boiling temperature.

It is used as a diluent in Pulvis Antimonialis and Extractum Euonymi.

*Has it any "direct" preparation?*

No. But it is chemically formed by the action of Phosphoric Acid and Calcium Lactate in the official preparation of Syrupus Calcii Lactophosphatis. Dose ½ to 1 dram.

*Give its Actions and Uses.*

It is not a very diffusable salt, very little of it being absorbed. It is a most important constituent of bones, and so is administersd to increase the growth and help the union of fractured bones, especially in pregnant women. Used also in rickets.

Milk, yolk of egg, vegetables, contain Calcium Salts.

## CALX SULPHURATA.

*Is this a Pure Salt?*

No, it is a mixture of 50 per cent. Calcium Sulphide with some Carbon and much Calcium Sulphate.

*Mention its Mode of Preparation and its Uses.*

By heating a mixture of Calcium Sulphate (Plaster of Paris) and wood charcoal.

It is used, in pill form, for various glandular enlargements and for inflammatory processes following influenza.

## CALCII CHLORIDUM.

*How is this prepared, and what are its Pharmaceutical Uses?*

By neutralizing Hydrochloric Acid with Calcium Carbonate and evaporating.

Owing to its great affinity for water, it is used for drying, in the preparation of Chloroform and Ether and Rectified Spirit.

## CALCII LACTAS.

*How is this prepared?*

Similar to preceding, substituting Dilute Lactic Acid for the Hydrochloric.

*What are the Actions and Uses of these Two Salts?*

Owing to their power of increasing the rate of coagulation of the blood, they are administered in Aneurysm, Hæmoptysis, Hæmophilia, Jaundice, and all cases where Hæmorrhage is the predominating feature. They are also administered in chilblains.

## CALX CHLORINATA.

*Name the Source and Preparations and the Cause of Activity of the Salt.*

By passing Chlorine gas over Slaked Lime.

Liquor Calcis Chlorinatæ, which yields 3 per cent. of Chlorine.

Liquor Sodæ Chlorinatæ, which yields 2·5 per cent. of Chlorine, and is administered internally. Dose 10 to 20 minims.

The liberation of Chlorine gas.

*What are the Actions and Uses of Chlorine Gas?*

It has a great affinity for Hydrogen, and on this account all articles to be disinfected must be moistened, so that the Hydrogen molecule of water unites with the Chlorine and liberates Oxygen. On this account Chlorine is a most

powerful *disinfectant* and *deodorizer*. It is also used in the form of Chlorine water as a wash for foul ulcers and discharges. Internally, it is used as a gargle in septic conditions of mouth and throat.

### CALCII HYPOPHOSPHIS.

*How is this obtained, and what is it used for?*

By heating phosphorus with slaked lime and water.
It is given as a general tonic in Phthisis.

## MAGNESIUM.

*Enumerate, with Doses, the Official Salts.*

| | Repeated doses. | Single dose. |
|---|---|---|
| Magnesii Carbonas Ponderosus. | 5 to 20 grs. | 30 to 60 grs. |
| Magnesii Carbonas Levis. | Do. | do. |
| Magnesia Ponderosa. | Do. | do. |
| Magnesia Levis. | Do. | do. |
| Magnesii Sulphas. | 30 to 90 grs. | ¼ to ½ ounce. |

### MAGNESII SULPHAS.

*What is its popular Name? Give its Various Sources.*

Epsom Salts.

1. Purification of the native Sulphate.
2. Interaction of "Dolomite" and Sulphuric Acid.
3. Interaction of "Magnesite" and Sulphuric Acid.

*Describe "Dolomite" and Magnesite.*

The former is native Carbonate of Calcium and Magnesium, and the latter native Magnesium Carbonate.

*What other Salts resemble the Sulphate?*

1. Zinc Sulphate, which is HEAVIER, with a METALLIC, ASTRINGENT taste.
2. Lead Acetate, which has a SWEET TASTE and ACETIC ODOUR.
3. Oxalic Acid, which has LARGER crystals, and a SOUR taste.

*Name the Official Preparations.*

Magnesii Sulphas Effervescens, dose 1 dram to 1 ounce.

Mistura Sennæ Composita, dose 1 to 2 ounces.

The other Magnesium Salts are prepared directly or indirectly from the Sulphate.

*What are its Applications?*

1. As a saline purgative. It is usually given along with some vegetable cathartic, as in the "black draught." It modifies osmosis, attracts water, and stimulates the intestinal glands.

2. It is useful in febrile conditions, because it removes the water of the blood, and is therefore a kind of blood-letting, and has supplanted venesection.

3. Also, for the same reasons, it is used to get rid of fluids, as in dropsy; and, in congestion of the head, where blood-letting is out of the question. This action is said to be rendered much more easy by adding ferrous sulphate.

4. As an antidote to ACUTE lead poisoning, as it forms the insoluble sulphate. This must not be allowed to pass down the canal, and therefore an emetic and purgative must be given.

5. In small doses it is a diuretic. Diuresis is always produced when sulphate of magnesium is given; this is due to the fact that a small dose is, as it were, left in the alimentary canal, and thus acts as a diuretic.

## MAGNESII CARBONAS PONDEROSUS.

*How is this obtained, and what are its Preparations?*

By mixing STRONG BOILING solutions of Sulphate o Magnesium and Carbonate of Sodium, evaporating and drying.

Liquor Magnesii Bicarbonatis, or "Fluid Magnesia." Dose 1 to 2 ounces. Also used in the preparation of Trochiscus Bismuthi Compositus.

## MAGNESII CARBONAS LEVIS.

*Mention its Mode of Preparation.*

In a similar manner to the preceding, but the solutions must be DILUTE and COLD when mixed, and boiled afterwards.

## MAGNESII OXIDUM.

*Name the Official Varieties.*

Magnesia Ponderosa, obtained by heating the HEAVY Carbonate. Magnesia Levis, obtained by heating the LIGHT Carbonate. Heating is required to expel the Carbonic Acid Gas.

*What other Names have the Oxides? State the Preparation in which they occur.*

Heavy Calcined Magnesia.
Light Calcined Magnesia.
Pulvis Rhei Compositus (Gregory's Powder) may contain either.

*Describe the Actions and Uses of the Carbonates and Oxides?*

They are ANTACID, giving off Carbonic Acid in the case of the Carbonates, which is a gastric sedative. When decomposed by the gastric juice, chloride, lactate, and bicarbonate of magnesium are formed. They are saline purgatives, but to a less extent than the Sulphate. Being insoluble and absorbed with difficulty, their actions on the blood and urine are less marked than the Potassium and Sodium Salts. By alkalizing the gastric contents they hinder absorption of alkaloids, and are therefore antidotes to these substances. They are used in Acid Dyspepsia and in Heartburn, also in the treatment of Gout combined with Colchicum.

## PLUMBUM.

*Name the Official Salts.*

1. Plumbi Oxidum. 2. Plumbi Acetas. 3. Plumbi Iodidum.

*What is Litharge, and how would you recognise it? Give its Official Preparation.*

It is Plumbi Oxidum, obtained by roasting lead in air.
It is a PALE, BRICK-RED, HEAVY, scaly powder.
Emplastrum Plumbi.

*What is "Sugar of Lead" and its Dose?*

Plumbi Acetas; obtained by dissolving Lead Oxide in dilute Acetic Acid.

1 to 5 grains.

It is a white crystalline powder, with an acetous odour and sweet taste.

*Name its Preparations.*

Pilula Plumbi cum Opio. 12 per cent Opium. Dose 2 to 4 grains.

Suppositoria Plumbi Composita. 1 grain of Opium in each.

Liquor Plumbi Subacetatis Fortis.

Plumbi Iodidi.

*What is peculiar about the Official Liquor? Give its Popular Name.*

Although made from the Acetate, the lead salt in Solution is Subacetate.

Goulard's Extract.

*What Preparations contain it?*

Liquor Plumbi Subacetatis Dilutus (Goulard's Lotion).

Glycerinum Plumbi Subacetatis.

Unguentum Plumbi Subacetatis.

*How is Plumbi Iodidum prepared? Describe it, and give its Official Preparation.*

By mixing solutions of Lead Acetate and Potassium Iodide and drying the precipitate.

It is a heavy, bright-yellow powder.

Its official preparation is Unguentum Plumbi Iodidi.

*In what Property do the Lead Salts differ?*

In solubility. Lead Acetate is soluble (1 in 2 of water), the other salts are insoluble.

*Describe the Actions and Uses of Lead Salts.*

Applied externally to sores and ulcers, their action is fourfold, viz. :—

(*a*) They coagulate the albumen of the discharge.
(*b*) They coagulate the albumen of the surrounding tissues.
(*c*) They, DIRECTLY, contract the local arterioles.
(*d*) They act as local sedatives.

For these reasons they are excellent astringents.

The Acetate is the only salt administered internally, and its actions on mucous surfaces are similar to the above, and although, in the stomach, it is converted into a chloride, its astringent and hæmostatic action is exerted on the whole alimentary canal. Lead Salts are used externally in weeping eczema and ulceration; as lotions in vulvitis, leucorrhœa, gleet, and otorrhœa. Internally, the Acetate is used as an astringent in Diarrhœa, as a hæmostatic in Gastric Ulcer and Intestinal Hæmorrhages.

*In what Variety of Ulceration is Lead contra-indicated?*

In ulceration of the Cornea, as the insoluble sulphate may be deposited between the corneal layers and cause permanent opacity.

## ARGENTUM.

*Name the Official Salt, its Mode of Preparation, and its Common Name.*

Argenti Nitras. Dose $\frac{1}{4}$ to $\frac{1}{2}$ grain.
By the interaction of Silver and Nitric Acid.
Lunar Caustic.

*What are the Preparations, and how are they obtained?*

1. Argenti Nitras Induratus or Toughened Caustic.
2. Argenti Nitras Mitigatus or Mitigated Caustic.

By fusing Silver Nitrate with Potassium Nitrate (5 per cent. for Induratus, 65 per cent. for Mitigatus) and pouring the product into moulds.

*Describe the External Actions and Uses of Silver Salts.*

Silver nitrate is a caustic, more powerful than the Lead Salts, but it does not penetrate deeply into the tissues: it is also Hæmostatic and Astringent, acting similarly to Lead. Its application as an astringent lotion is accompanied by pain and irritation, so that it differs in this respect from lotions of Lead. It is employed to destroy warts and excessive granulations. As a lotion it is applied to indolent ulcers and bedsores. In a solution of 5 grains to 1 ounce of water, it is used as an injection in gleet. Weaker solutions (2 grains to 1 ounce) are employed for granular lids in ophthalmia. It is also applied to boils and smallpox vesicles to prevent pitting.

*How would you make an aqueous Solution, and how should it be given internally?*

With Distilled Water, because the presence of chlorides and organic impurities would decompose the nitrate.

It should be given in the form of a Pill made with Kaolin.

*Describe its Internal Actions and Uses.*

In the stomach the Nitrate is decomposed by the hydrochloric acid and mucus, into Chloride and an Albuminate, and the Silver is absorbed. That absorption of the metal takes place is proved by the presence of discoloured skin and mucous surfaces in cases where the use of the drug has been long continued. It has been used in gastric ulcers, in combination with Opium; in cholera infantum and diarrhœa, and as a sedative to the nervous system in epilepsy and chorea.

*What is "Argyria"?*

It is a brown or black discolouration of the gums, buccal mucous membrane, and skin, due to the deposit of metallic silver, and is produced by the administration of silver Salts for a long period.

## ZINCUM.

*Name the Official Salts which are given internally.*

1. Zinci Acetas, dose 1 to 2 grains.
2. Zinci Valerianas, dose 1 to 3 grains.
3. Zinci Sulphas, dose (tonic) 1 to 3 grains, (emetic) 10 to 30 grains.
4. Zinci Oxidum, dose 3 to 10 grains.

*What are the remaining Salts?*

1. Zinci Chloridum.
2. Zinci Carbonas.
3. Zinci Oleostearas.

### ZINCI CHLORIDUM.

*How is this prepared, and what are its Characters?*

By the interaction of Hydrochloric Acid and Zinc.

In colourless opaque rods or tablets, very deliquescent. They are distinguished, by their Astringent feeling, from the rods of Caustic Potash, which have a Soapy feeling, and are usually thinner.

*Describe its Actions and Uses, and give its Preparation.*

It is a powerful caustic, penetrating deeply; also a strong antiseptic. It is used to destroy warts, nævi, lupoid patches, etc.

Liquor Zinci Chloridi.

### ZINCI SULPHAS.

*State the Source and Official Preparation.*

By the interaction of Zinc and Sulphuric Acid.

Unguentum Zinci Oleatis.

*Describe its Actions and Uses.*

Applied to an ulcerated surface it acts as an astringent. It is used also as an injection in gonorrhœa, leucorrhœa, vulvitis; as an astringent application in conjunctivitis Internally in large doses it acts directly on the stomach, as a prompt emetic without producing depression. In smaller doses its astringent effect is beneficial in diarrhœa, and it is given as a nervous depressant in hysteria, epilepsy, and chorea.

*What is "Lotio Rubra"?*

It is "Red Lotion," an aqueous solution of Zinc Sulphate (2 grains to 1 ounce) coloured red with compound tincture of lavender.

## ZINCI CARBONAS.

*How is this prepared?*

By boiling together solutions of Zinci Sulphate and Sodium Carbonate and drying the precipitated salt.

*What is "Calamine"?*

Impure Zinc Carbonate, which is not official.

*What are the Uses of the Official Salt?*

Rarely used except to make the oxide and acetate, but the impure salt is an ingredient in many ointments and lotions for eczema.

## ZINCI OXIDUM.

*How may this be prepared?*

1. By reducing the Carbonate at a dull red heat.
2. By the combustion of metallic zinc in air.

*Name the Official Preparation, and describe its Uses.*

Unguentum Zinci.

Externally for excoriated surfaces and slight ulcerations.

Internally, as an astringent to check the night sweats of phthisis.

### ZINCI OLEOSTEARAS.

*Describe this Salt, and give its Use.*

It is an insoluble white amorphous powder, prepared by mixing a solution of hard and curd soaps with a solution of zinc sulphate.

It is used as an application to sores and ulcers, when a mild astringent effect is desirable.

### ZINCI ACETAS.

*How is this obtained, and what is it used for?*

By dissolving zinc carbonate in diluted acetic acid, boiling and drying the crystallised product.

Similar to the sulphate.

### ZINCI VALERIANAS.

*Give the Source and Uses.*

By saturating iso-valerianic acid with zinc carbonate.

It is used in Hysteria and other neurotic conditions, also in Anæmia.

## CUPRUM.

*What is the Official Salt? Give its Common Names and Source.*

Cupri Sulphas, dose (astringent) ¼ to 2 grains; (emetic) 5 to 10 grains.

Bluestone, Blue Vitriol.

It is obtained by the interaction of copper and diluted sulphuric acid.

*Describe its Actions and Uses.*

Applied externally to reduce exuberant granulations, it has a powerful caustic effect. In dilute solutions it is

astringent and antiseptic, and is used for the same purposes as zinc sulphate. Internally, in small doses, it is strongly astringent, and is used for severe diarrhœa. In larger doses it acts directly on the stomach as a powerful emetic, and for this purpose is employed in infantile bronchitis and laryngitis. As an antidote in cases of phosphorus poisoning it is particularly serviceable, being deposited as copper on the phosphorus, rendering it inert.

*Contrast its Emetic Action with that of Zinc Sulphate.*

It is more irritating that the zinc salt, acting more readily, but if it fails to act, the stomach must be emptied by other means, otherwise the copper sulphate will cause acute inflammation.

## BISMUTHUM.

*Name the Official Salts, with Doses.*

1. Bismuthi Carbonas
2. Bismuthi Subnitras
3. Bismuthi Salicylas

} Dose 5 to 20 grains.

*How is the Carbonate obtained? Mention its other Names and Preparation.*

By the interaction of Bismuth Nitrate and Ammonium Carbonate.

It is also called Bismuth Oxycarbonate, Bismuth Subcarbonate, and is found in Trochiscus Bismuthi Compositus.

*How is the Subnitrate prepared, and by what other Name is it known?*

By the interaction of Bismuth Nitrate and water. It is also known as Bismuth Oxynitrate.

*What Precautions are necessary in prescribing it?*

With water it always yields a little free acid, and hence when ordered with Bicarbonate of Sodium, there is libera-

tion of $CO_2$, or if ordered with Potassium Iodide, there is liberation of free Iodine. These incompatibilities are overcome by substituting Bismuthi Carbonas.

*What is the Official Preparation?*

Liquor Bismuthi et Ammonii Citratis, dose ½ to 1 dram.

*How is Bismuthi Salicylas prepared? Give its other Name.*

By the interaction of Sodium Salicylate and Bismuth Nitrate.

It is also called Bismuth Oxysalicylate.

*What are the Internal Actions and Uses of Bismuth Salts?*

They act as astringents to the intestinal tract and are antiseptic. The Subnitrate splits up into Bismuth Oxide and Nitric Acid, which form Bismuth Sulphide and nitrous vapours, the former colouring the fæces black, and the latter acting as an antiseptic.

Bismuth Salts are used to check various gastric disorders, such as gastric pain, vomiting due to chloroform, pregnancy or ulcer. They are also used in diarrhœa.

*How should these Salts be dispensed?*

As they are all insoluble, they should, when prescribed in a mixture, be suspended with tragacanth powder. Acacia powder should not be used, because this forms a compact mass which is not easily disintegrated.

*Are Bismuth Salts used externally?*

They are dusted on sores as protectives and mild astringents.

## ALUMINIUM.

*What is Alumen?*

Alum may be either a mixture of the Sulphate of Aluminium and Potassium (Potassium Alum), or a mixture of the Sulphates of Aluminium and Ammonium (Ammonium Alum).

*Give the Dose and the Official Preparation.*

5 to 10 grains.
The official preparation is Glycerinum Aluminis.

*Describe Exsiccated Alum?*

It is Potassium Alum from which 45 per cent. of the water has been driven off with heat.

*What is Kaolin? Mention the Official Preparation containing it.*

It is a native Silicate of Aluminium powdered and freed from gritty particles.
Pilula Phosphori.

*What are the Uses of Alum?*

It is applied as a lotion to ulcers and sores, when, by coagulating the albumen of the discharges, it acts as an astringent. It also coagulates the albumen of the surrounding tissues, compressing and occluding the blood vessels, thus acting as a hæmostatic. It is used as an astringent in weeping eczema, vulvitis, leucorrhœa and gleet; as a gargle in tonsilitis, pharyngitis, etc. It is a gastric irritant, and is used to produce emesis in infantile bronchitis.

## FERRUM.

*In what Forms is Metallic Iron official?*

1. Ferrum, annealed iron wire or wrought-iron nails free from oxide.
2. Ferrum Redactum (Reduced Iron), containing not less that 80 per cent. of metallic iron with some iron oxide, dose 1 to 5 grains.

*Name the Official Preparation of Iron Wire.*

Vinum Ferri, dose 1 to 4 drams.

*How is Reduced Iron obtained? Give its Official Preparation.*

By passing Hydrogen gas over Ferric hydroxide heated in a gun-barrel.

Its official preparation is Trochiscus Ferri Redacti, each containing 1 grain.

*In what Form do the Official Salts of Iron exist?*

In the Ferrous condition (except the Scale Preparations).

*Name the Official Ferrous Salts, with their Doses.*

1. Ferri Sulphas, dose 1 to 5 grains.
2. Ferri Sulphas Exsiccatus, dose ½ to 3 grains.
3. Ferri Carbonas Saccharatus, dose 10 to 30 grains.
4. Ferri Phosphas Saccharatus, dose 5 to 10 grains.

## FERROUS SALTS.

### FERRI SULPHAS.

*How is this prepared, and what are its Characters and Official Preparation?*

Dissolve iron wire in diluted Sulphuric Acid and crystallise. Pale green, oblique, rhombic prisms, with a styptic taste. Mistura Ferri Composita ("Griffith's Mixture"), dose ½ to 1 ounce.

### FERRI SULPHAS EXSICCATUS.

*Give its Source, Character, and Preparations.*

Heat the sulphate crystals to 212° F. till aqueous vapour ceases to be given off. It is a dirty white powder which easily absorbs water. Its preparations are Pilula Ferri (Blaud's Pill), dose 5 to 15 grains; Pilula Aloes et Ferri, dose 4 to 8 grains.

## FERRI CARBONAS SACCHARATUS.

*How is this prepared, and what is its Composition?*

Mix together aqueous solutions of Ferrous Sulphate and Ammonium Carbonate; collect the precipitate, dry it and mix with sugar.

It is a mixture of Peroxide of Iron, sugar and not less than 50 per cent of Ferrous Carbonate.

## FERRI PHOSPHAS SACCHARATUS.

*Describe its Mode of Preparation?*

Mix aqueous solutions of Ferrous Sulphate and Sodium Phosphate, adding Bicarbonate of Sodium, washing and drying the precipitate and mixing it with sugar.

*Why is Sodium Bicarbonate added?*

To neutralise the sulphuric acid which is formed by the reaction, as this acid would dissolve the phosphate of iron.

*What other Preparations contain Phosphate of Iron?*

1. Syrupus Ferri Phosphatis, dose ½ to 1 dram.
2. Syrupus Ferri Phosphatis cum Quinina et Strychnina, known as Easton's Syrup, dose ½ to 1 dram.

*Name another Syrup containing Iron.*

Syrupus Ferri Iodidi, dose ½ to 1 dram.

## FERRIC SALTS.

*Are there any of these Official?*

Not in the form of Salts, but there are two Liquors which are solutions of Ferric Salts, viz. Liquor Ferri Perchloridi Fortis, and Liquor Ferri Persulphatis (*vide* LIQUORES).

*What is Liquor Ferri Persulphatis used for? Name these Preparations.*

It is used to prepare the "Scale Preparations" of Iron.

1. Ferri et Ammonii Citras
2. Ferri et Potassii Tartras } dose 5 to 10 grains.
3. Ferri et Quininæ Citras

## FERRI ET AMMONII CITRAS.

*How is this prepared, and what are its Characters and Official Preparation?*

It is made by precipitating a diluted solution of the persulphate with a diluted solution of ammonia, drying the precipitate and dissolving it in a hot solution of citric acid; then neutralise with ammonia, evaporate, and dry in thin layers on porcelain or glass plates; and then break up into scales. It is found in garnet-coloured scales, soluble 2 in 1 of water. Its preparation is Vinum Ferri Citratis, dose 1 to 4 drams.

## FERRI ET POTASSII TARTRAS.

*Mention its Mode of Preparation and Characters.*

Similar to the preceding, substituting Acid Tartrate of Potassium for Acid Citric. It has very deep garnet-coloured scales, soluble 1 in 4 of water.

## FERRI ET QUININÆ CITRAS.

*How is this prepared? Give its Characters.*

Similar to Ferri et Ammonii Citras, but freshly precipitated Quinine is also dissolved in the hot solution of citric acid. It is found in greenish yellow or golden scales, very deliquescent, and soluble 2 in 1 of water.

*What is the Base of the three Scale Preparations?*

Ferric Hydrate.

*Describe the External Action of the "Ferric Salts."*

When applied to abraded skin, sores, ulcers, etc., they coagulate the albumen of the discharge and of the surrounding tissues, as well as coagulating the blood, and are therefore very powerful Astringents and Hæmostatics.

*Why do Iron Preparations, when taken internally, blacken the Teeth and Tongue, and how can this be avoided?*

Because the Sulphur, derived from the food and the tartar on the teeth, forms Sulphide of Iron. The blackening can be avoided by taking the preparations through a quill or a glass tube.

*What is the Effect on the Stomach when Iron is administered?*

All Iron Salts given by the mouth are converted into Ferric Chloride in the stomach. If strongly acid salts are given, the acid set free, after the formation of the chloride, will act as an irritant, injure the mucous membrane, cause headache, nausea, loss of appetite, and other severe gastric symptoms.

*What do we learn from this?*

1. Always give dilute solutions of Ferric Salts.
2. Always give Iron after food; never on an empty stomach.
3. Use preparations of Iron which are only slightly acid, or not acid at all.

*Describe the Intestinal Action of Iron?*

When the Chloride passes from the stomach into the intestine it becomes converted into Ferric Oxide by the alkaline contents, and as it passes towards the colon, it meets with Sulphur compounds, Nascent Hydrogen, and other products of decomposition, becoming converted into Ferrous Sulphide, and as such is eliminated with the fæces which are turned black.

*How do you explain the Astringent Effect on the Bowels?*

When a large amount of an astringent preparation has been given it is not wholly converted into chloride in the stomach, and so passes on to the intestines, where its astringency still takes effect and causes constipation.

*How is Iron absorbed?*

Its absoption takes place in the upper part of the small intestine. · Here it is taken up by the epithelium in very minute amounts, and passes into the leucocytes of the blood, being ultimately deposited in the liver and spleen.

*What is the Effect of Iron on the Blood?*

In anæmia, where the amount of Hæmoglobin in the blood is diminished, the iron which is absorbed from the intestine and passes into the leucocytes, acts as a Hæmatinic, as the iron in the blood exists only in combination with Hæmoglobin.

*Mention some of the Uses of Iron.*

1. The Perchloride is used to arrest hæmorrhage from leech-bites, from the nose, from hæmorrhoids, from the uterus, etc.
2. It is also used as a paint for inflamed pharynx, fauces, or tonsils.
3. Used internally for hæmatemesis and intestinal hæmorrhage.
4. In chlorosis and secondary anæmias.
5. As an antidote for arsenic.

*How would you overcome the Constipating Effects of Iron?*

By combining it with Epsom Salts in a Mixture, or with Aloes in a Pill.

*How would you administer it as an antidote for Arsenic?*

Mix one ounce of Sodium Carbonate diluted with water with three ounces of Liquor Ferri Perchloridi (not Fortis),

and give half an ounce of this mixture every five or ten minutes.

*What is the Theory of this Action?*

The above mixture forms Peroxide of Iron, which on coming in contact with the Arsenic forms an insoluble Arsenite. This can be expelled by a large dose of Magnesium Sulphate.

## HYDRARGYRUM.

*How is this obtained?*

By roasting Cinnabar (Native Mercuric Sulphide).

*Enumerate the Preparations containing Free Mercury.*

1. Hydrargyrum cum Cretâ, dose 1 to 5 grains.
2. Emplastrum Hydrargyri.
3. Pilula Hydrargyri, dose 4 to 8 grains.
4. Unguentum Hydrargyri, from which the remaining two are made:—
5. Linimentum Hydrargyri.
6. Unguentum Hydrargyri Compositum. Scott's Dressing

*What is "Grey Powder," and what is the Effect of keeping upon it?*

Hydrargyrum cum Cretâ; a mixture of 1 part of Mercury and 2 parts of Prepared Chalk.

It becomes more active when kept, as the mercury is liable to become converted into mercuric oxide.

*How would you classify the Official Mercurial Salts?*

Into Mercurous and Mercuric Salts.

### HYDRARGYRI SUBCHLORIDUM.

*Describe this Salt, its Source and Dose.*

Calomel or Mercurous Chloride. It is the only official

Mercurous Salt. It is formed when a mixture of Mercurous Sulphate and Sodium Chloride is heated; the subchloride collects as a sublimate. Its dose is $\frac{1}{2}$ to 5 grains.

*What are the Official Preparations?*

1. Lotio Hydrargyri Nigra.
2. Pilula Hydrargyri Subchloridi Composita, dose 4 to 8 grains.
3. Unguentum Hydrargyri Subchloridi.

*Describe the Actions and Uses of Calomel.*

Applied externally to sores and ulcers it has a stimulating effect. Administered internally, it exerts an irritant effect on the duodenum, hurrying on the contents, preventing the re-absorption or alteration of the bile, and acting as a purgative. By such action on the duodenum it is an indirect cholagogue.

*How would you assist the Purgative Action of Calomel?*

By giving a saline purgative a few hours later, as this will act chiefly on the lower part of the bowel.

## MERCURIC SALTS.

### HYDRARGYRI OXIDUM RUBRUM.

*How is this obtained? Give its Common Name and Official Preparation.*

By heating Mercuric Nitrate until acid vapours cease to be evolved. Red Precipitate. Unguentum Hydrargyri Oxidi Rubri.

### HYDRARGYRI OXIDUM FLAVUM.

*State the Source and Official Preparation.*

By the interaction of aqueous solutions of Mercuric Chloride and Caustic Soda. Unguentum Hydrargyri Oxidi Flavi.

## HYDRARGYRI IODIDUM RUBRUM.

*Give its Source, Dose, and Preparations.*

By the interaction of Mercuric Chloride and Potassium Iodide, $\frac{1}{32}$ to $\frac{1}{16}$ grain. Liquor Arsenii et Hydrargyri Iodidi, dose 5 to 20 minims. Unguentum Hydrargyri Iodidi Rubri.

*What other Name has the Liquor?*

Donovan's Solution.

## HYDRARGYRUM OLEATUM.

*Describe this Substance and mention its Official Preparation.*

A light, greyish-yellow, oleaginous, semi-solid substance, prepared by triturating Mercuric Oxide with Liquid Paraffin, adding Oleic Acid and stirring whilst heating.

Its preparation is Unguentum Hydrargyri Oleati.

## HYDRARGYRI PERCHLORIDUM.

*What Other Names has it?*

Mercuric Chloride; Corrosive Sublimate.

*State its Source, Dose, and Preparations.*

When a mixture of Mercuric Sulphate, Sodium Chloride, and Manganese Dioxide is heated, the perchloride sublimes and is condensed.

The dose is $\frac{1}{32}$ to $\frac{1}{16}$ grain (same as the Red Iodide).

Its preparations are Liquor Hydrargyri Perchloridi, dose 30 to 60 minims.

Lotio Hydrargyri Flava.

## HYDRARGYRUM AMMONIATUM.

*What is this Substance and its Official Preparation?*

A precipitate obtained by mixing solutions of Ammonia and Perchloride of Mercury. Also known as "White Precipitate."

Unguentum Hydrargyri Ammoniati.

## ACTION OF MERCURY AND MERCURIC SALTS.

*Describe the External Uses of the Perchloride?*

A solution of 1 in 1000 is Antiseptic and Germicidal. Metallic instruments cannot be disinfected with it, as Mercury would be deposited on them.

*What interferes with its Antiseptic Properties and how may it be Prevented?*

If Albumen is present, an albuminate of mercury is formed, and the antiseptic value is destroyed.

This effect may be obviated by the addition of either Hydrochloric or Tartaric Acid.

*Name another Antiseptic Salt of Mercury and those which are Anti-parasitic.*

The Red Iodide is antiseptic, and the Oxides, White Precipitate, Oleate, and Perchloride are Anti-parasitic.

*How may Mercury be administered?*

1. By the mouth.
2. By the rectum.
3. Endermically, *i.e.* applied locally as a lotion or dusting powder.
4. By inunction, *i.e.* by rubbing in an ointment.
5. Intramuscularly, *i.e.* hypodermic injection into a muscle.
6. Fumigation. Calomel is generally used for this.
7. Inhalation. Rarely or never used.
8. Baths.

*What is the action of Mercuric Salts on the Stomach and Intestines?*

The metal itself has a similar action to Calomel (*q.v.*) but the mercuric compounds produce severe gastro-intestinal irritation.

*How do the Mercurial Salts act in Syphilis?*

As a direct poison to the Spirochæta pallida.

*How is Mercury excreted?*

By the cæcum, colon, and saliva chiefly, but minute amounts are excreted by urine, sweat, milk, and bile. It is eliminated very slowly.

*What are the Symptoms of Mercurialism?*

1. Slight fœtor of the breath and soreness of the gums.
2. Disagreeable metallic taste, gums swollen and liable to bleed.
3. Profuse secretion of saliva.
4. Tongue swollen, teeth loose, saliva more abundant, enlargement and tenderness of parotid and salivary glands.

## SULPHUR.

*Name the Official Varieties of Sulphur?*

1. Sulphur Sublimatum, or "Flowers of Sulphur," dose 20 to 60 grains.
2. Sulphur Præcipitatum, or "Milk of Sulphur," dose 20 to 60 grains.

*How would you Distinguish them?*

Sublimed Sulphur is a greenish-yellow, GRITTY powder.
Precipitated Sulphur is a greyish-yellow, NON-GRITTY powder.

*How is Sublimed Sulphur obtained? Give the Official Preparation?*

From crude sulphur by sublimation.
Unguentum Sulphuris.
It is also contained in Pulvis Glycyrrhizæ Compositus.

*How is Precipitated Sulphur obtained, and what are its Preparations?*

Boil together Sulphur and Lime, which forms a solution of Calcium Sulphides and Thiosulphate. To this solution add Hydrochloric Acid when the Sulphur is precipitated.

1. Confectio Sulphuris.
2. Trochiscus Sulphuris.

*Describe the External Uses of Sulphur?*

Used as a parasiticide for Scabies. The skin should first be well scrubbed with soft soap and hot water, after which the ointment should be well rubbed in.

*How does Sulphur act internally?*

In the intestines, the alkaline fluids convert it into sulphuretted hydrogen and other sulphides. These increase the intestinal secretions, slightly stimulate the muscular coat, and produce a mild laxative effect.

*How is it excreted?*

(1) By the rectum, unchanged; (2) by the urine, as sulphates; (3) by the milk, skin, and lungs, as sulphuretted hydrogen.

## IODUM.

*What is Iodine? Give its Characters and Official Preparations.*

It is a volatilized element obtained from "Kelp" (ashes of seaweed), and from mineral Iodides and Iodates.

It is found in the form of dark-coloured laminar scales, with a metallic lustre, and yielding a violet vapour when heated.

Its preparations are—

1. Tinctura Iodi Fortis.
2. Tinctura Iodi Mitis, dose 2 to 5 minims.
3. Unguentum Iodi.

*What is Peculiar about the Preparations?*

They all contain Iodide of Potassium, as a solvent for the Iodine.

*Describe the External Actions and Uses of Iodine?*

It is disinfectant and irritant, causing a burning sensation, dilatation of the blood vessels, some œdematous swelling, and exudation of leucocytes, when applied in strong solution. It produces a yellow stain on the skin, and is used as a counter-irritant for chronic inflammatory joints, pleurisy, chilblains, periostitis, etc.

*How would you avoid staining the Skin?*

By adding a strong solution of Ammonia to the solution of iodine; this decolorises the solution, but it interferes with the action of the iodine, as Iodide and Iodate of Ammonium are formed, and any virtue such a solution contains is due to excess of Ammonia.

*What are the Internal Uses of Iodine?*

Minute doses are given at frequent intervals to arrest vomiting. Preparations of seaweeds have a quack reputation for reducing obesity.

## IODIDES.

*Name the Official Salts.*

1. Potassii Iodidum, dose 5 to 20 grains (*vide* Potassium).
2. Sodii Iodidum, dose 5 to 20 grains (*vide* Sodium).
3. Arsenii Iodidum, dose $\frac{1}{20}$ to $\frac{1}{5}$ grain (*vide* Arsenic).
4. Hydrargyri Iodidum Rubrum, dose $\frac{1}{32}$ to $\frac{1}{10}$ grain (*vide* Mercury).
5. Plumbi Iodidum.
6. Acidum Hydriodicum Dilutum, dose 5 to 10 minims.

*Why is this Acid classed as an Iodide?*

Because it contains, when fresh, 10 per cent. by weight of Hydrogen Iodide.

*Give its Official Preparation.*

Syrupus Acidi Hydriodici, dose $\frac{1}{2}$ to 1 dram.

*Describe the Internal Actions and Uses of Iodides.*

Iodides are converted into the Sodium Salt and an Albuminate, the former being quickly absorbed and passing into the tissues. Here some of the iodine is liberated, and combining with albuminous molecules, is quickly excreted. Metabolism is thus accelerated, and an Alterative effect is produced. It is largely used in tertiary syphilis; rheumatoid arthritis; gonorrhœal rheumatism; aneurysms; angina pectoris; bronchitis, etc.; and is occasionally administered to decrease the secretion of milk.

*What causes Depression after giving Potassium Iodide?*

Potassium is a muscle poison, and depresses the circulation by its action on the heart muscle. The Sodium Salt is not depressant.

*Describe "Iodism" and give its Symptoms.*

It is a train of symptoms produced by excessive use of Iodides.

Its symptoms are heavy pain over the frontal sinus, running at the nose, sore throat, increased salivation, skin eruptions, etc.

*How would you prevent these?*

1. By doubling the dose that caused it.
2. By large doses of Sodium Bicarbonate.
3. By adding Ammonium Carbonate to the solution.

*How are the Iodides excreted?*

They are rapidly eliminated by the urine, saliva, sweat, and mucous membranes.

## BROMIDES.

*Name their Official Salts.*

1. Potassii Bromidum, dose 5 to 30 grains (*vide* Potassium).
2. Sodii Bromidum, dose 5 to 30 grains (*vide* Sodium).
3. Ammonii Bromidum, dose 5 to 30 grains (*vide* Ammonium).
4. Strontii Bromidum, dose 5 to 30 grains.
5. Acidum Hydrobromicum Dilutum, dose 15 to 60 minims.

*Why is this Acid classified as a Bromide?*

Because it contains 10 per cent. of Hydrogen Bromide.

*How is the Strontium Salt prepared?*

By neutralising dilute Hydrobromic Acid with Strontium Carbonate.

*Describe the Actions of the Bromides.*

1. Nervous System.—The reflex excitability of the spinal cord is diminished; the functions of the brain are depressed; muscular activity is diminished. They therefore act as Hypnotics and Nerve Depressants.
2. Generative System.—Continuous use of bromides decreases the sexual appetite and abolishes sexual vigour.
3. Circulatory.—The heart is slowed and weakened in action by depression of its nervo-muscular substance and the medullary centres.
4. Respiratory.—There is slight depression of respiration.
5. Metabolism.—The amount of $CO_2$ exhaled is decreased; the amount of urine is increased.

*What are the Therapeutic Uses of Bromides?*

1. Epilepsy and infantile convulsions.
2. Insomnia from overwork, worry, and at the climacteric period.
3. Incontinence of urine in children.
4. Neuralgia, headache, or migraine.

5. Laryngismus stridulus and whooping cough.
6. Delirium tremens and mania when no organic lesion exists.
7. Antidotes for strychnine poisoning.

*What is Bromism and its Symptoms?*

A series of symptoms due to excessive use of Bromides.

1. A red papular rash on the face and back.
2. A general lowering of cutaneous sensibility.
3. Diminution of sexual power, fatigue, inability to work, and clouded intellect.
4. Dementia, melancholia, and other mental disorders.

*How are Bromides excreted?*

They are rapidly eliminated by the skin, saliva, kidneys, milk, bronchial and intestinal mucous membranes.

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# CARBON COMPOUNDS.

## ALCOHOL ETHYLICUM—ETHYL HYDROXIDE.

*Enumerate the Official Varieties.*

1. Alcohol Absolutum, contains 99 per cent. by weight of Ethyl Hydroxide.
2. Spiritus Rectificatus, contains 90 per cent. by volume of Ethyl Hydroxide, and from which the following are prepared by dilution :—
3. Alcohol, 70 per cent. by volume Ethyl Hydroxide.
4. Alcohol, 60 per cent. do. do.
5. Alcohol, 45 per cent. do. do.
6. Alcohol, 20 per cent. do. do.

*What are the External Actions of Alcohol?*

Antiseptic, Refrigerant, Anhidrotic; but if its evaporation from the skin is prevented it passes through the epidermis, dilates the vessels locally, and becomes Rubefacient. It extracts water from all tissues.

*Describe the Gastric Effects of* (1) *Moderate Dose of Alcohol*, (2) *Large Doses.*

Moderate doses produce dilatation of gastric vessels, reddening of the mucous membrane, increased secretion of gastric juice, thus acting as a digestive adjuvant.

In large doses the activity of gastric juice is destroyed, the gastric mucous membrane is inflamed, large quantities of mucus are secreted, thus gastritis is produced; and if the indulgence is extended over a lengthened period, the gastric glands atrophy and chronic dyspepsia results.

*What are the Reflex Effects of a Moderate Dose?*

The Heart beats more rapidly and more forcibly, the vessels of the entire body dilate, the blood-pressure rises, and there is a feeling of warmth.

*How does it effect Metabolism and the Body Temperature?*

As it becomes oxidised in the body it saves the tissues and is a food.

There is dilatation of all the cutaneous blood vessels and increased activity of the sweat glands, so that an antipyretic effect is produced owing to increased radiation from the dilated vessels and evaporation of the increased perspiration.

*Describe the Effect on the Nervous System?*

Unless the dose be very large, the entire nervous system is stimulated, so that there is an abundant flow of ideas, sharpening of the senses, and an exaggerated feeling of strength. If the dose has been large, there is great depression and helplessness. In any case depression follows after the stimulating effect has passed off.

*What are the Various Uses of Alcohol?*

1. Applied externally, in various forms, as an evaporating lotion, for headache, sprained joints, bruises, etc.

2. For the indigestion of the aged and feeble, as a

digestive adjuvant, it is administered, in small doses, before or during a meal.

3. As an antipyretic in fevers and acute inflammations.
4. As a vascular stimulant in syncope and collapse.

## CHLOROFORMUM.

*How is this prepared, and what is its Dose?*

By the distillation of rectified spirit, with chlorinated and slaked lime, subsequent purification with water and sulphuric acid, redistillation, and then adding 2 per cent. ethylic alcohol to the redistilled product.

The dose is 1 to 5 minims.

*Enumerate the Official Preparations.*

1. Aqua Chloroformi, dose ½ to 2 ounces.
2. Linimentum Chloroformi.
3. Spiritus Chloroformi, dose 5 to 20 minims.
4. Tinctura Chloroformi et Morphinæ Composita, dose 5 to 15 minims.

*What are the External Actions of Chloroform, and the Gastric Effects of a small Dose?*

Similar to, but more powerful than, Alcohol.

Internally its effects are similar, in every respect, to Alcohol.

*Describe the General Anæsthetic Effects of Chloroform.*

The effects following inhalation may be divided into three stages:—

1st Stage.—General stimulation of all functions, causing excited imagination, confused mind, and a general feeling of warmth and comfort. This stimulative period is of short duration, and is rapidly followed by loss of consciousness and considerable blunting of general sensation; at the same time the motor functions become stimulated, and there is much struggling, accompanied by increased arterial pulsations, with frequent respirations. The pupils are usually dilated during this stage.

2nd Stage.—General depression of all functions, struggling ceases, the pulse and respirations become less strong and less frequent, and the patient falls into complete unconsciousness. The pupils are contracted in this stage.

3rd Stage.—Total abolition of reflex excitability and all muscular tone; urine and fæces may be passed; pupils become widely dilated; cardiac and respiratory centres greatly depressed; the pulse feeble and irregular; respirations slight and irregular with long pauses between them, and cyanosis becomes very evident.

*What is the Danger Signal in administering Chloroform, and when should the Surgeon Operate?*

The condition of the pupil. Operation should take place at the end of second stage.

*What Precautions are necessary in administering Chloroform?*

1. Watch the pulse, respiration, and pupil.
2. No matter how simple the operation, see that muscular relaxation is complete, otherwise the stimulus of the knife may reflexly stop the heart.
3. See that the heart is not feeble nor fatty, and that the lungs are in a healthy condition.
4. If vomiting occurs, see that the larynx is kept clear.
5. Remove all artificial teeth.
6. See that the patient is kept warm.

## ÆTHER.

*Describe this Drug and its Preparation, and give its Dose.*

It is Ethyl Oxide or Sulphuric Ether, and is prepared by distilling a mixture of ethylic alcohol with sulphuric acid, shaking up the product with slaked lime and water and re-distilling.

For repeated administration the dose is 15 to 30 minims, for a single administration, 45 to 60 minims.

*Name its Preparations?*

Æther Purificatus.
Spiritus Ætheris, dose 20 to 40 minims.

*What is Acetic Æther?*

It is a liquid obtained by distilling a mixture of ethylic alcohol, acetic acid, and sulphuric acid, and purifying; it contains 90 per cent. of ethyl acetate.

*Describe the Gastric Action of Æther.*

A moderate dose increases the gastric secretion and movements and dilates the gastric vessels, at the same time it, reflexly, excites the heart, increasing the force and frequency of the pulse and causing a rise of blood-pressure.

*How does it differ from Chloroform as a General Anæsthetic?*

1. It is less liable to inhibit cardiac action.
2. It has a less depressant effect on respiration.
3. The stimulation stage is longer, there is more struggling.
4. The stage of complete anæsthesia is not reached so soon.
5. There is a greater reduction of temperature.
6. The odour is more disagreeable.
7. It is eliminated more slowly.
8. It is more inflammable and cannot be used beside a naked light.
9. It is more difficult to administer.
10. It is more irritant to the bronchial mucous membrane.

*What is the A.C.E. Mixture?*

It is composed of Absolute Alcohol, 1 part; Chloroform, 2 parts; Ether, 3 parts, and is much employed as a general anæsthetic.

*Mention some other Uses of Æther.*

1. Carminative in flatulent dyspepsia.
2. Anti-spasmodic during an attack of asthma.
3. Subcutaneously injected as a cardiac stimulant.
4. As a spray to produce local anæsthesia for minor operations.

## ETHYL CHLORIDE.

*How is this obtained, and what are its Uses?*

By the action of hydrochloric acid on ethylic alcohol.

It has a low boiling point and produces intense cold by its evaporation. On this account it is used to produce local anæsthesia in minor operations. It is sometimes used as an inhalation to precede the administration of Æther as a general anæsthetic.

## ACETONUM.

*What is this substance?*

It is a colourless, mobile, volatile liquid, obtained by the dry distillation of calcium acetate or barium acetate.

*Name an Official Preparation containing it and its Use.*

Liquor Epispasticus, used in this as a solvent for cantharidine. It is used as a solvent for resins, fats, celluloid, etc.

## CHLORAL HYDRAS.

*Describe Chloral.*

It is an oily liquid prepared by saturating ethylic alcohol with dry chlorine.

*What is formed by adding water to purified Chloral?*

Chloral Hydrate. Its dose is 5 to 20 grains.

*Indicate its Characters?*

Colourless crystals with a peculiar pungent odour and a bitter taste; very soluble in water, and forming a liquid when mixed with an equal weight of camphor.

*Give the Official Preparation and its Actions.*

Syrupus Chloral. Dose ½ to 2 drams.

1. Circulatory System.—It is a cardiac depressant; also

depresses the vaso-motor centre, causing dilatation of the blood-vessels and a fall of blood-pressure.

2. Nervous System.—In the brain, all the medullary centres are depressed, and by its action on the grey matter of the cerebrum, sleep is produced. On the spinal cord it depresses the anterior cornual cells, abolishing reflex excitability, but the motor nerves and muscles are not affected.

*Why is it used as an Hypnotic?*

Because it depresses the brain much earlier than any other part.

*What are some of its Uses?*

1. Mixed with camphor it relieves neuralgia.
2. To produce sound, natural sleep without bad after effects in insomnia from overwork, worry, etc.
3. As a cerebral depressant in delirium tremens, convulsions, etc.
4. In tetanus, whooping cough, incontinence of urine.
5. In strychnine poisoning.

*What Advantages has it over Opium or Morphine?*

1. It is rapid and certain in action.
2. It produces no bad after-effects.
3. It does not derange the stomach nor cause constipation.
4. It is safer in the case of children.

*Has it any Disadvantages?*

1. It does not relieve pain.
2. It does not relieve cough due to lung disease.
3. It sometimes causes excitement in cases of mania.

## BUTYL-CHLORAL HYDRAS.

*How is this prepared? Describe its Characters and give its Dose.*

By adding water to butyl-chloral, which is made by passing dry chlorine gas through aldehyde.

Pearly-white crystalline scales with a pungent odour like chloral hydrate, but only soluble 1 in 50 of water.

Its dose is 5 to 20 grains.

*What are its Uses?*

It has a specific action on the fifth nerve, and is used to relieve trigeminal neuralgia. It has similar effects to chloral hydrate, but is less certain, and is reputed to be less depressant to the heart.

## CHLORAL FORMAMIDUM.

*Give its other Name and Mode of Preparation.*

Chloralamide.

It is formed by direct combination of formamide with anhydrous chloral.

*What are its Characters and Dose?*

Shining, colourless crystals, taste bitter; soluble 1 in 20 of water; easily decomposed; should be kept in amber-coloured bottles.

Its dose is 15 to 45 grains.

*Describe its Actions and Uses.*

An excellent hypnotic, producing no bad after-effects, and little or no cardiac, vaso-motor, or respiratory depression. It does not relieve pain, and so is useless for insomnia due to pain.

It is used to relieve insomnia due to worry, overwork, etc., and is reputed to be a specific for sea-sickness.

*How is its Non-depressant Action explained?*

It is split up, in the blood, into chloral and formamide, and the latter is said to prevent the depressant effects of the chloral.

*How should it be administered?*

It is best given dissolved in a little brandy, and water

added, and taken before going to bed. If given in powder form, it is very slowly absorbed, and is liable to be decomposed in the intestines, so that its hypnotic power may be lost.

## PARALDEHYDUM.

*What is Paraldehyde and its Dose?*

A clear, colourless liquid, having an ethereal odour and burning taste, soluble 1 in 10 of water, freely soluble in alcohol. It is a product of the polymerization of acetaldehyde. Its dose is ½ to 2 drams.

*Mention its Use, and any Objections to it.*

It is a powerful hypnotic, and produces no bad after-effects. May be used for patients suffering from cardiac disease; employed largely in cases of melancholia and mania.

It has a nasty taste, and the unpleasant persistent odour affects the breath after administration.

*How would you prescribe it?*

In capsules or as a draught.

℞

| | |
|---|---|
| Paraldehydi | ʒiss |
| Syrupi Aurantii | ℥i |
| Aquæ ad | ℥iii |

Misce. Fiat haustus.

## SULPHONAL.

*What are the Characters of Sulphonal and its Dose?*

It is a colourless, inodorous, nearly tasteless, crystalline powder; very slightly (1 in 450) soluble in water. Its dose is 10 to 30 grains.

*Give its Action, and how is it administered?*

It is a non-depressant hypnotic. Being so very insoluble it is absorbed with difficulty, and takes at least two hours to act. It is best administered in cachets a few hours before bedtime.

## METHYL SULPHONAL.

*What is the popular Name of this Substance? Give its Dose and Uses.*

Trional.

It is given in 10 to 20 grain doses, and is similar in character and action to sulphonal, but is much quicker in action.

## BARBITONUM.

*Mention another Name for this Substance, and its Dose and Actions.*

Veronal.

Its dose is 5 to 10 grains. It is a hypnotic, acting on the central nervous system, and does not depress the heart. Occasionally it produces a severe erythematous rash.

## ACETANILIDUM.

*What is the common Name of this Drug, how is it obtained, and what Amount is prescribed?*

Antifebrin.

By heating glacial acetic acid and aniline, and purifying the distillate. It is given in 2 to 5 grain doses.

## PHENAZONUM.

*What is the popular Name and its Dose?*

Antipyrine.

Given in 5 to 15 grain doses.

*In what Property does it differ from the Preceding and Succeeding Salts?*

It is freely soluble in water. Whilst antifebrin is soluble only 1 in 200, and phenacetin only 1 in 1700.

## PHENACETINUM.

*What is its Dose?*

5 to 15 grains.

*Describe the Chief Actions of these three Drugs.*

1. They are powerful antipyretics, exerting this influence only in cases of pathological pyrexia, and in such cases their action is due to a decrease in heat production, and not to any slight diaphoretic action they may possess; they act directly upon the part of the central nervous system which is concerned with heat production.
2. They are all powerful analgesics.

*What is their Action on the Heart?*

They exert a directly paralysing action on the cardiac muscle, and are thus cardiac depressants. Acetanilide is the most, and phenacetin the least depressant.

*Mention some of the Uses of these Drugs.*

1. To relieve the pains of neuralgia, sciatica, dysmenorrhœa, migraine, locomotor ataxy, etc.
2. To reduce the temperature in various fevers.

*What Precaution is necessary in their Use as Antipyretics?*

Remember their depressing effect on the heart, and that patients suffering from pyrexia have often cardiac irregularity.

## PHENOLPHTHALEIN.

*What is this Substance, and its Common Name and Dose?*

It is a white, inodorous, tasteless, crystalline powder, almost insoluble in water, and obtained by heating phenol with phthalic anhydride and sulphuric acid. It is commonly called "Purgen." Its dose is 2 to 5 grains.

*Describe its Use.*

An excellent purgative, acting directly on the intestinal mucous membrane, and purging in about six hours without griping. As it is not depressant it may be used in cardiac cases.

## RESORCIN.

*What are its Characters and Dose?*

In colourless, shining, acicular crystals, with a faint odour, and a pungent, sweet, subsequently bitter, taste. Dose 1 to 5 grains.

*Describe its Uses.*

Being a cardiac depressant it is rarely given internally. Used chiefly as a lotion to remove epidermic scales in chronic skin diseases, and scurf in seborrhœa sicca. It is also antiseptic and is injected into the bladder in cystitis.

## CREOSOTUM.

*What are its Source, Characters, and Dose?*

It is a product of the distillation of beech tar.

It is a slightly yellow liquid of variable composition, having a strong, peculiar odour and a burning taste. It is given in 1 to 5 minim doses.

*Give its Official Preparation and Uses.*

Unguentum Creosoti.

1. As a parasiticide in foul ulcers. 2. As an antiseptic in phthisis. 3. As an astringent in diarrhœa, hæmoptysis, and hæmatemesis. 4. As a sedative in vomiting of a reflex nature. 5. As an anæsthetic in toothache.

## GUAIACOL.

*How may this be obtained? Describe its Characters and Dose.*

By the fractional distillation of beech tar creosote.

It is a colourless liquid, or may be in crystalline form (melting at 28° C.), with a tarry odour and pungent caustic taste. Dose 1 to 5 minims.

*What Salt of Guaiacol is Official? Give its Uses.*

Guaiacol Carbonate. Dose 5 to 15 grains.

1. As an antiseptic in phthisis.
2. To relieve the pain in chronic osteo-arthritis.

## IODOFORMUM.

*Describe its Mode of Formation, Characters, and Dose.*

By heating Iodine with Potassium Carbonate, Alcohol and water, and allowing the crystalline deposit to settle.

In small, lustrous, lemon-coloured crystals, with a powerful persistent odour. It contains 96·7 per cent. of Iodine. Dose $\frac{1}{2}$ to 3 grains.

*Mention its Preparations, and on what it depends for its Action.*

Suppositoria Iodoformi.

Unguentum Iodoformi.

It depends, on its decomposition and the liberation of Iodine, which takes place in the tissues after the Iodoform has been dissolved by fatty matters.

*What are its Chief Actions and Uses?*

Local stimulant, antiseptic, disinfectant, and slight anæsthetic. Applied to wounds, sores, and ulcers, especially of the tuberculous and syphilitic varieties. Injected as an emulsion with Glycerin into sinuses and abscess cavities.

Used in the form of bougies for the urethra and the nose; the suppository being useful for painful rectal conditions.

*Is it much used internally?*

Its antiseptic properties have been tested in phthisis, but the results have been disappointing.

## NAPHTHOL.

*What are its Characters and Dose?*

White, shining, laminar crystals or in powder; odour like phenol; taste pungent; soluble 1 in 1000 of water; easily soluble in alcohol, ether, chloroform; and in 1 in 8 of olive oil. Dose 3 to 10 grains.

*Describe its Actions and Uses.*

It is a powerful antiseptic. A 10 per cent. ointment cures scabies. It is administered internally as an intestinal antiseptic in infantile diarrhœa and in typhoid fever.

## CRESOL.

*Name its Characters and Official Preparation.*

A straw-coloured liquid, becoming brown on keeping or on exposure to light. Dose 1 to 3 minims. The official preparation is Liquor Cresol Saponatus.

*What are its Uses?*

1. As an antiseptic; it may replace carbolic acid, being less poisonous and less caustic.
2. As a gastro-intestinal antiseptic.
3. If volatilized in the sick-room it benefits whooping cough.

## HEXAMINE.

*Mention its Source, Characters, and Uses.*

It is a colourless, crystalline, inodorous powder, soluble in water, obtained by the interaction of ammonia with formic

aldehyde. Dose 5 to 15 grains. It is popularly known as urotropin. It is a powerful urinary antiseptic, being administered in cases of cystitis, bacilluria and nocturnal incontinence of urine in children due to bacillus coli. Has a slight diuretic action.

*On what does it depend for its Action?*

Formation of formaldehyde in the urine, which should be acid; and for this purpose it is usually given with acid phosphate of sodium.

## GLUSIDUM.

*What is the other Name? Give its Uses.*

Saccharin.

It is employed as a sweetening agent, when from any cause, such as diabetes, sugar cannot be taken.

*How is soluble "Saccharin" prepared?*

By mixing Gluside with Sodium Bicarbonate.

## PARAFFINA.

*How many Official Varieties of Paraffin are there?*

1. Paraffinum Liquidum. Dose ½ to 1 ounce.
2. Paraffinum Durum.
3. Paraffinum Molle. This is popularly known as Vaseline.

*What are the Uses of the Liquid Paraffin?*

Being unabsorbed from the alimentary canal, it acts as an excellent mechanical aperient, and is used as such in cases of chronic constipation and in colitis.

*Give the Formula for Unguentum Paraffini.*

A mixture of Hard Paraffin 27 parts; Soft Paraffin 70 parts; white wax 3 parts.

*Indicate the Uses of Hard and Soft Paraffins.*

A basis for ointments which are applied to protect sores and wounds; they are not used as a basis when the drug is required to be absorbed, as they are absorbed with difficulty by the unbroken skin.

## CARBON DISULPHIDUM.

*What is this Substance, and for what purpose is it used officially?*

It is a clear colourless liquid, with a characteristic odour; prepared by the combination of Carbon and Sulphur at a high temperature. It is used officially in making Pilula Phosphori, and a solvent for rubber and phosphorus.

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# ORGANIC ACIDS.

## ACIDUM CARBOLICUM.

*Describe its Source, Character, and Dose.*

It is obtained by the fractional distillation of coal-tar oil, and subsequent purification.

It has colourless, deliquescent crystals, with a peculiar odour, and a sweetish, pungent taste; often reddish-coloured owing to impurities. It becomes liquid at 40° C.; does not redden litmus, and coagulates albumen. Dose 1 to 3 grains.

*What are the Preparations?*

1. Acidum Carbolicum Liquefactum. Dose 1 to 3 minims.
2. Glycerinum Acidi Carbolici.
3. Suppositoria Acidi Carbolici.
4. Trochiscus Acidi Carbolici.
5. Unguentum Acidi Carbolici.

Also enters into the preparation of Injectio Ergotæ Hypodermica.

*Describe the Effect of Carbolic Acid on the Skin.*

If concentrated it acts as an irritant and caustic, producing a white spot, which, if the application is prolonged, results in a slough. In weaker solutions it produces local anæsthesia.

*What is the Effect of Carbolic Acid on the Urine?*

When Carbolic Acid, whether administered in moderate doses, or absorbed from surgical dressings, is excreted by the urine, it causes the urine to become darker. This is due to the oxidation of the acid in the tissues and the subsequent formation of pyrocatechin, hydroquinone, phenyl, sulphuric acid, and glycuronic acid.

*Mention the Uses of Carbolic Acid.*

1. As an Antizymotic to arrest fermentation.
2. As an Antiseptic, Disinfectant, and Deordorant.
3. As a local Anæsthetic to the skin.
4. As an Inhalation in phthisis, bronchorrhœa, and lung gangrene.
5. As a sedative in gastric dilatation.

## ACIDUM ACETICUM.

*What Varieties of Acetic Acid are Official?*

1. Acidum Aceticum Glaciale—a colourless liquid containing not less than 98·9 per cent. Hydrogen Acetate.
2. Acidum Aceticum contains 33 per cent. of Hydrogen Acetate, and from it is prepared—
3. Acidum Aceticum Dilutum. Dose ½ to 2 drams.

*Give the other Preparations made from Acidum Aceticum.*

1. Oxymel. Dose ½ to 2 drams.
2. Acetum Scillæ. Dose 5 to 15 minims.
3. Acetum Urgineæ. Dose 5 to 15 minims.

*Name the Preparations of Glacial Acetic Acid.*

1. Acetum Cantharidini.
2. Linimentum Terebinthinæ Aceticum.

*What are the Uses of Acetic Acid?*

Glacial Acetic Acid is escharotic and vesicant.

Acetic Acid is applied externally for ringworm, and is used internally as a sialagogue and refrigerant.

## ACIDUM BENZOICUM

*Indicate the Source, Characters, and Dose of this Drug.*

It is obtained by the sublimation of Benzoin. It is found in light, feathery, crystalline needles, almost colourless, and with a slight aromatic odour. Dose 5 to 15 grains.

*What are the Official Preparations?*

1. Ammonii Benzoas. Dose 5 to 15 grains.
2. Sodii Benzoas. Dose 5 to 30 grains.
3. Tinctura Camphoræ Composita. Dose ½ to 1 dram.
4. Tinctura Opii Ammoniata. Dose ½ to 1 dram.
5. Trochiscus Acidi Benzoici; ½ grain in each.

*Describe the Actions and Uses of Benzoic Acid.*

Its chief action is that it renders alkaline urine acid, and stimulates and disinfects the urinary tract. When administered it is excreted by the urine as hippuric acid, the conversion taking place in the renal cells. Benzoic acid is also excreted by the bronchial mucous membrane, disinfecting it and stimulating the expulsion of mucus. It is used in pyelitis and cystitis; also as an expectorant in bronchitis and phthisis.

## ACIDUM CITRICUM.

*What is the Source and Dose of this Acid?*

The juice of the fruits of various species of Citrus; *e.g.* the lemon. Dose 5 to 20 grains.

*What Preparations contain Free Citric Acid?*

Succus Limonis and Syrupus Limonis.

## ACIDUM TARTARICUM.

*Give the Source and Dose of this Acid, and Name the Official Pill containing it.*

Potassium Acid Tartrate (Cream of Tartar). The dose is 5 to 20 grains, and Pilula Quininæ Sulphatis contains it.

*What are the Uses of Citric and Tartaric Acids?*

Salts of these acids have a deoxidising effect on the blood, being converted into carbonates, liberating $CO_2$, and increasing the alkalinity of the blood. Citrates act as diuretics, being excreted by the urine which is rendered alkaline; tartrates act similarly, but to a less extent. Acetic Acid and Acetates have the same action.

## ACIDUM OLEICUM.

*What are its Characters?*

A straw-coloured oily liquid with a faintly rancid odour obtained by the action of steam upon the olein of fats.

*Name the Preparations of which it is an ingredient.*

1. Unguentum Atropinæ.
2. Unguentum Aconitinæ.
3. Unguentum Cocainæ.

*Why is it used in these Ointments?*

Because it dissolves alkaloids (but not their salts), and being more quickly absorbed than oils or fats, it renders these preparations more active.

*Are there any Official Oleates?*

Hydrargyri Oleas is official.
Emplastrum Plumbi contains Plumbi Oleatis.
Unguentum Zinci Oleatis contains Zinci Oleatis.

## ACIDUM TANNICUM.

*What is its Source and Dose?*

Extracted from specially fermented Galls by water saturated with ether. Dose 5 to 10 grains.

*Mention its Preparations?*

1. Glycerinum Acidi Tannici.
2. Suppositoria Acidi Tannici.
3. Trochiscus Acidi Tannici.

*Describe its Actions and Uses.*

1. It coagulates albuminous discharges and is applied to ulcerating mucous surfaces as an astringent.
2. It coagulates blood and is used as a hæmostatic.
3. It is used in hæmatemesis, diarrhœa, and intestinal hæmorrhages.
4. As an astringent application in tonsillitis, pharyngitis, otorrhœa, etc.

## ACIDUM HYDROCYANICUM DILUTUM.

*Mention the Source, Character, and Dose of this Acid, also its Popular Name.*

It is obtained by the interaction of potassium ferrocyanide and sulphuric acid.

It is a colourless, volatile, unstable liquid, containing 2 per cent. by weight of hydrogen cyanide. Dose 2 to 5 minims. Prussic Acid.

*Give its Official Preparation, and any other Drugs which contain it.*

Tinctura Chloroformi et Morphinæ Composita; strength 5 per cent.

Aqua Laurocerasi and the preparations of Virginian Prune Bark contain it.

*What are its Actions?*

It is quickly absorbed by mucous membranes and produces a sedative and anæsthetic effect on the mouth and stomach. By its stimulating actions on the vagal centre it acts as a cardiac depressant, and reduces the blood-pressure. It also depresses the respiratory centre.

*Describe its Uses.*

1. To soothe malignant gastric disease, ulcers, and painful dyspepsia.
2. To check the vomiting of pregnancy; along with bismuth.
3. To allay dry and irritating cough.
4. Externally to relieve itching.

*What Precaution is necessary in using it externally?*

The surface must not be raw, as it is quickly absorbed.

*Name a Physiological Antidote.*

Atropine, which paralyses the inhibitory fibres of the vagus and excites the respiratory centre.

## ACIDUM LACTICUM.

*How is this obtained, and what are its Characters and Dose?*

By the fermentation of Lactose.

It is a colourless syrupy liquid, containing not less than 75 per cent. of hydrogen lactate. Dose 15 to 30 minims.

*What are its Uses?*

1. As a spray in diphtheria to dissolve the membrane.
2. As an application in tuberculosis of the larynx.
3. As an intestinal disinfectant, especially of the large bowel.

## ACIDUM SALICYLICUM.

*What are the Sources, Characters, and Dose of this Drug?*

1. Natural; from oil of Wintergreen, or Oil of Sweet Birch.
2. Chemical; by the interaction of Sodium Phenate and Carbon Dioxide. It is obtained in inodorous, prismatic, colourless crystals; taste first sweetish then acid; easily diffused and irritating to the nostrils. Dose 5 to 20 grains.

*Which Preparations contain it?*

Unguentum Acidi Salicylici.
Injectio Cocainæ Hypodermica.

*State its Actions and Uses.*

Methyl Salicylate, which is contained in Oil of Wintergreen, is rapidly absorbed when rubbed into the skin, and consequently natural Salicylic Acid when applied to the skin exerts an antiseptic and anhidrotic action. When given internally, it acts as a gastric irritant unless well diluted, and in the bowel it becomes absorbed, probably in the form of sodium salicylate, and is excreted by the urine as salicyluric acid. It is a cardiac depressant and acts as an antipyretic. It is used—

1. To check excessive perspiration.
2. In strong solution, with Indian Hemp, for warts, corns, etc.
3. In rheumatic fever.
4. In diabetes.

## ACIDUM ACETYLSALICYLICUM.

*Give the Source, Popular Name, and Dose.*

It is obtained by the action of Acetic Anhydride on Salicylic Acid. The popular name is Aspirin. The dose is 5 to 15 grains.

*What are its Uses?*

To relieve the pains of chronic rheumatism, sciatica, migraine, dysmenorrhœa, etc.

## ACIDUM PICRICUM.

*Describe its Characters and Source.*

It is a bright yellow, crystalline, inodorous powder, soluble in 90 parts of water, and 10 parts of alcohol. Its solution, when applied externally, stains the skin yellow. It is obtained by the action of nitric acid on phenol.

*What are its Uses?*

It is a powerful antiseptic, and a one per cent. solution is very efficacious for burns.

It is also used as a test for albumen in the urine.

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# INORGANIC ACIDS.

*How may these be classified?*

1. Concentrated Liquid.
2. Dilute Liquid.
3. Solid.

*Name the Concentrated Liquid Acids.*

1. Acidum Hydrochloricum.
2. Acidum Nitricum.
3. Acidum Phosphoricum Concentratum.
4. Acidum Sulphuricum.
5. Acidum Sulphurosum.

*Name the Solid Acids.*

1. Acidum Boricum.
2. Acidum Chromicum.

*Name, with Doses, the Dilute Acids.*

1. Acidum Hydriodicum Dilutum. Dose 5 to 10 minims.
2. Acidum Hydrobromicum Dilutum. Dose 15 to 60 minims.
3. Acidum Hydrochloricum Dilutum.
4. Acidum Nitricum Dilutum.
5. Acidum Nitro-hydrochloricum Dilutum.
6. Acidum Phosphoricum Dilutum.
7. Acidum Sulphuricum Aromaticum.
8. Acidum Sulphuricum Dilutum.

} Dose 5 to 20 minims.

*Mention the Preparations of Sulphuric Acid?*

1. Acidum Sulphuricum Dilutum.
2. Acidum Sulphuricum Aromaticum.

*What Preparation contains the Dilute Acid?*

Infusum Rosæ Acidum.

*Give the Popular Name of the Aromatic Acid, and its other Ingredients.*

Elixir of Vitriol. It also contains, Spirits of Cinnamon; Tincture of Ginger; and Alcohol.

*Has it an Official Preparation?*

Yes; it is contained in Infusum Cinchonæ Acidum.

*What are the Actions of Sulphuric Acid?*

1. It is a powerful caustic, having a great affinity for water, and leaving the carbon of the tissues untouched, it leaves a black slough.

2. It also coajulates the albumen of the tissues and acts as an astringent.

3. The dilute acid forms with lead salts an insoluble sulphate of lead, and the acid is usually taken by lead-workers to prevent lead absorption.

*How is Sulphurous Acid obtained?*

By deoxidising sulphuric acid, by heating it with charcoal, and dissolving the resulting gas in water.

*Describe its Actions and Uses.*

It has a powerful affinity for Oxygen, and so readily decomposes organic bodies. For the same reasons it destroys micro-organisms and arrests fermentation.

It is used externally as a disinfectant, deodorant, and antiseptic. It has been used internally in Cholera.

*What are the Preparations of Hydrochloric Acid?*

1. Acidum Hydrochloricum Dilutum.
2. Acidum Nitro-hydrochloricum Dilutum.

*What is the chief Use of these dilute Acids, and how should they be administered?*

They are given in dyspepsia due to deficient gastric juice, and should be taken always after a meal, except when the gastric secretion is excessive, and the patient complains of acid eructations and heartburn, because they check excessive formation of the gastric acid.

*Name the Preparations of Nitric Acid.*

1. Acidum Nitricum Dilutum.
2. Acidum Nitro-hydrochloricum Dilutum.

*What is the Composition of Dilute Nitro-hydrochloric Acid?*

It contains free chlorine, hydrochloric, nitric, and nitrous acids.

*Describe the External Uses of Nitric Acid.*

It is employed as a caustic to destroy warts, condylomata, chancres, cancrum oris, and phagadœnic sores. It stains the skin yellow.

*How is Concentrated Phosphoric Acid prepared? Give its Official Preparation.*

By boiling phosphorus (to oxidise it) with nitric acid and water, evaporating till coloured vapours cease to rise, and then diluting.

Acidum Phosphoricum Dilutum.

*Mention some Properties common to the Mineral Acids.*

1. In concentrated form they are powerful caustics and irritants.
2. In dilute form they are astringent, hæmostatic, and refrigerant.
3. When diluted and given internally, they decrease **Acid** secretions and increase **Alkaline** secretions.
4. They slightly increase the acidity of the blood.

*Explain the Action of Dilute Acids in Dyspepsia.*

1. Saliva.—This being an alkaline secretion is increased.
2. Gastric Juice.—This being acid the secretion is diminished.
3. Pancreatic Juice.—This being alkaline, the quantity is increased.

*Name the Official Preparation of Dilute Hydriodic Acid, and give its Active Principle.*

Syrupus Acidi Hydriodici. Dose ½ to 1 dram.

It is a 10 per cent. solution of Hydrogen Iodide, and has a similar action to Iodides (*q.v.*).

*How is Dilute Hydrobromic Acid prepared, and on what does its Action depend?*

By the interaction of potassium bromide and sulphurous acid. It is a 10 per cent. solution of Hydrogen Bromide, and has a similar action to Bromides (*q.v.*).

## ACIDUM BORICUM.

*Give its Source and Preparations.*

By the action of Sulphuric acid on Borax.

1. Glycerinum Acidi Borici.
2. Unguentum Acidi Borici.
3. As a source of Sodii Biboras (Borax).

*What are its Uses, and how is it excreted?*

1. Being a weak acid it does not irritate, and is used as an antiseptic for wounds, ulcers, and sores.

2. Saturated solutions are used for vaginitis, urethritis, ophthalmia, and perspiring feet.

3. As a urinary antiseptic in alkaline cystitis. It is excreted, by the urine, saliva, sweat and fæces.

## NITRITES.

*Enumerate this Official Class, with Doses.*

1. Amyl Nitris. Dose 2 to 5 minims.
2. Sodii Nitris. Dose ½ to 2 grains.
3. Liquor Ethyl Nitritis. Dose 15 to 60 minims.
4. Spiritus Ætheris Nitrosi. Dose 15 to 60 minims.
5. Liquor Trinitrini. Dose ½ to 2 minims.
6. Tabellæ Trinitrini. Dose 1 or 2 tablets.

*How is Spiritus Ætheris Nitrosi prepared? Give its Composition and Popular Name.*

By distilling a mixture of alcohol, nitric acid, sulphuric acid, and copper, and dissolving the distillate in 90 per cent. alcohol.

It is a mixture of ethyl nitrite, alcohol and oxidised products. It is known as Sweet Spirit of Nitre.

*State its Actions and Uses.*

It is a diffusible stimulant, stomachic, and carminative, but its chief use is as a diaphoretic and diuretic in mild

febrile attacks, chronic Bright's disease, and œdema of cardiac origin.

*Does it act like the other Nitrites?*

Its action as a nitrite is due to the ethyl nitrite it contains, but as this is so diluted its "nitrite" action is very feeble.

*Indicate the Source, Characters, and Mode of Administration of Amyl Nitris.*

It is obtained by the interaction of nitrous acid and distilled amylic alcohol. It is an ethereal liquid of a pale yellow colour, and an odour of sweetmeat pear drops. Insoluble in water, but soluble in ether or alcohol. It is given by inhalation from a handkerchief in which a glass capsule containing it has been crushed.

*What are its Actions?*

1. On the circulation.—Within a minute the face flushes, the heart beats rapidly and violently, and pulsation is evidenced throughout the entire body. The vessels rapidly dilate, and the blood pressure and arterial tension fall very low.

2. On the respiration.—The rapidity and depth of respiration are increased at first, but are, later on, depressed.

3. On the temperature.—There is a considerable fall, due to vascular dilatation.

*Describe its Uses.*

1. In angina pectoris and the pains of thoracic aneurysm.
2. In syncope and dangerous pallor in chloroform anæsthesia.
3. In epilepsy during the aura.
4. In asthma and in migraine.

*What is Nitro-glycerin?*

It is a colourless oily liquid, very explosive, obtained by dropping glycerin into a cold mixture of sulphuric and nitric acids.

*Is it official?*

No; but the Liquor Trinitrini and Tabella Trinitrini are.

*Contrast its Action with that of Amyl Nitris.*

Its action is similar, but being administered by the mouth, is slower in onset and more persistent.

*On what does its Action depend?*

Although it is really a **nitrate**, its action depends on the formation of **Sodium Nitrite** directly it is absorbed by the blood.

*How is Sodium Nitris prepared? Give its Characters.*

By fusing sodium nitrate with lead, the latter extracts oxygen from the former, converting it into the nitrite.

It is white, crystalline, deliquescent powder, very soluble in water.

*Contrast its Action with that of Amyl Nitris.*

Similar in action, but slower and gentler.

*Mention the Source and Action of Liquor Ethyl Nitritis.*

By the interaction of alcohol, sodium nitrite, and diluted sulphuric acid, at a low temperature. Its action is similar to Sodium Nitrite.

# OFFICIAL PREPARATIONS.

## ACETA.

*Describe an "Acetum" and enumerate the Aceta and their Doses.*

A solution of the active principles of a drug, extracted by maceration or by digestion with Glacial Acetic Acid, or ordinary Acetic Acid, or with both.

1. Acetum Cantharidini. Never given internally.
2. Acetum Scillæ. Dose 5 to 15 minims.
3. Acetum Urgineæ. Dose 5 to 15 minims.

*Why is Glacial Acetic Acid used for Acetum Cantharidini?*

Because the ordinary Acetic Acid (which is also used) is too weak a solvent.

*Mention the Preparations containing Acetum Scillæ.*

1. Oxymel Scillæ.
2. Syrupus Scillæ.

*N.B.*—Acetum Urgineæ has similar preparations.

## AQUÆ.

*What is an "Aqua," and how does it differ from a Liquor?*

Apart from Aqua Destillata, it is a weak solution of a volatile substance in water.

It differs from a liquor which is generally a solution of a *non-volatile* substance.

*How are the "Aquæ" prepared?*

1. By distillation of the drug with water.
2. By distillation of the essential oil with water.
3. By simple solution in cold water.

*Are these Methods always adhered to?*

No; in hot climates it is permissible to prepare those distilled from the drug by adding to water the volatile oil

with some insoluble powder to diffuse it through the water, and subsequently filtering.

*Enumerate, with Doses, the Aquæ prepared by Distillation of the Drug.*

1. Aqua Anethi.
2. Aqua Anisi.
3. Aqua Aurantii Floris.
4. Aqua Carui. } Dose 1 to 2 ounces.
5. Aqua Cinnamomi.
6. Aqua Fœniculi.
7. Aqua Rosæ.
8. Aqua Laurocerasi. Dose ½ to 2 drams.

*What is peculiar about Orange Flower Water and Rose Water?*

Before using they are directed to be made by diluting, with twice its volume of distilled water, a saturated solution of the volatile oil; this latter solution is obtained by distillation from the respective drug.

*What should be noted concerning Cherry Laurel Water?*

1. The smallness of the dose.
2. That it is "standardized" to contain ·1 per cent. of Hydrocyanic Acid.

*Define "Standardization."*

It is the making of an official preparation so that it shall contain a certain fixed proportion of the chief active principle of the drug concerned.

*Name the Aquæ prepared by distillation of the Essential Oil, and those which are simply Solutions in Cold Water.*

1. Aqua Menthæ Piperitæ and Aqua Menthæ Viridis. Dose 1 to 2 ounces.
2. Aqua Camphoræ and Aqua Chloroformi. Dose 1 to 2 ounces.

*Is Camphor Water a "simple" solution?*

No; as camphor is soluble 1 in 700 of water only, it is directed that a little alcohol (90 per cent. strength) should be used as a solvent.

## COLLODIA.

*What are these, and what are they used for?*

Solutions of Pyroxylin in a volatile solvent.

When applied to small wounds, the ethereal solvent evaporates and the result is a protective film.

*Name the Official Collodia?*

1. Collodium.
2. Collodium Flexile.
3. Collodium Vesicans.

*Give the Composition of Collodium Flexile.*

It is Collodion with an addition of Canada Turpentine and Castor Oil. These additions are made to ensure that the coating left on the wound will be flexible and not crack.

## CONFECTIONES.

*Describe a "Confection" and mention any other Names.*

A preparation made of the consistence of a paste with a basis of sugar or honey.

Electuary; Bolus; Conserve.

*Enumerate the Official Confections.*

1. Confectio Rosæ Gallicæ. Used chiefly as a pill excipient.
2. Confectio Piperis.
3. Confectio Sennæ. } Dose 60 to 120 grains.
4. Confectio Sulphuris.

*What other Name has Confection of Pepper, what is its Composition and Uses?*

Ward's Paste. It contains Black Pepper, Caraway, and Honey. To relieve hæmorrhoids, ulcers of the rectum, and fissures of the anus, as during its excretion it stimulates the mucous membrane of rectum.

*Give the Composition of Confection of Senna and its Popular Name.*

Senna, Coriander, Cassia pulp, Figs, Prunes, Tamarinds, Liquorice, Sugar and Water. It is commonly known as Lenitive Electuary.

*What does Confection of Sulphur contain?*

Precipitated Sulphur, Cream of Tartar, Tragacanth, Syrup, Glycerin, Tincture of Orange.

## DECOCTA.

*What is a "Decoction"?*

A solution of the non-volatile active principles of a vegetable drug, obtained by boiling in distilled water, in a covered vessel, for ten minutes and then straining. As it readily decomposes, it should be freshly prepared.

*How would you classify the Decoctions, and what is the Dose?*

1. Astringent.
2. Demulcent.
3. Purgative.

} The dose of each is ½ to 2 ounces.

*Enumerate the Astringent Decoctions, and name the Substance to which their Astringency is due.*

1. Decoctum Acaciæ Corticis.
2. Decoctum Gossypii Radicis Corticis.
3. Decoctum Hæmatoxyli.
4. Decoctum Sappan.

Their astringency is due to tannin.

*What other Drug does Decoction of Logwood contain?*

Cinnamon Bark.

*Enumerate the Demulcent Decoctions, and give the Cause of their Soothing Action.*

1. Decoctum Agropyri.
2. Decoctum Ispaghulæ.

Their soothing character is due to the mucilage they contain.

*Mention the Purgative Decoction, and its Composition.*

Decoctum Aloes Compositum.

Compound Tincture of Cardamoms; Liquorice Extract; Aloes Extract; Myrrh; Potassium Carbonate (*N.B.* Initial letters = CLAMP).

*Why is Carbonate of Potassium employed?*

Because resins form with alkalies (in which they are soluble), resin soaps, and so prevent precipitation of the insoluble resins.

## EMPLASTRA.

*What is a "Plaster"?*

A solid adhesive compound, usually in a cylindrical roll, which when ordered for use, is heated to a soft tenacious consistence and spread, with a heated spatula, upon leather or swansdown.

*How are the Plasters classified?*

1. Those the basis of which is Lead Plaster.
2. Those the basis of which is Resin Plaster.
3. Various other bases.

*Give the Preparation of Emplastrum Plumbi.*

It is Lead Oleate or Lead Soap and is prepared by boiling Lead Oxide in water and olive oil, so that chemical action

takes place, Lead Oleate being formed, with Glycerin as a bye-product.

*Name the Plasters containing Lead Plaster.*

1. Emplastrum Hydrargyri.
2. Emplastrum Saponis.
3. Emplastrum Resinæ.

*Mention the Composition of Mercurial Plaster.*

Besides Lead it contains Mercury, Olive Oil and Sublimed Sulphur. The sulphur forms with some of the mercury, sulphide of mercury, which separates the globules of mercury, the remainder of the mercury existing free.

*What is "Adhesive" Plaster?*

Emplastrum Resinæ.

*Name the Plasters containing Resin Plaster and their Peculiarity.*

1. Emplastrum Belladonnæ.
2. Emplastrum Calefaciens.

Each contains a standard amount of active principle: viz.
Emplastrum Belladonnæ ·25 per cent. of Alkaloid.
Emplastrum Calefaciens ·02 per cent. of Cantharidin.

*From what Belladonna Preparation is the Plaster made?*

From the Liquid Extract, which is evaporated.

*Why is "Warming" Plaster so called?*

Because it contains only sufficient Cantharidin to produce a rubefacient effect.

*Give the Strength of Emplastrum Cantharidini, its Composition and Consistence.*

·2 per cent. Cantharidin. It produces a vesicant effect. It is composed of Cantharidin; Chloroform; Yellow Beeswax; Wool Fat; and has the consistence of a "thick" ointment.

*What is the Composition of Emplastrum Menthol?*

Menthol; Yellow Beeswax; Resin.

## EXTRACTA.

*Describe an "Extract"?*

A preparation containing the active principles of a drug, such principles being, in the case of a "non-liquid" extract, obtained in solution by subjecting the crude drug to the action of various menstrua, and evaporating such solution to a desired consistence.

*Describe a "Liquid" Extract.*

A concentrated solution of the active principles of a drug, obtained by subjecting the drug, in various states of comminution, to the action of a certain menstruum. The finished product always contains alcohol, so that the solution may be regarded as a concentrated alcoholic infusion.

*Classify the "Non-Liquid" Extracts.*

| | | |
|---|---|---|
| *A.* Alcoholic Menstruum | 1. Extractum Cannabis Indicæ. | |
| | 2. Extractum Ergotæ. | |
| | 3. Extractum Rhei. | |
| | 4. Extractum Belladonnæ Siccum. | Standardized. |
| | 5. Extractum Nucis Vomicæ Siccum. | Standardized. |
| | 6. Extractum Hyoscyami. | Standardized. |
| *B.* Aqueous Menstruum | 1. Extractum Opii Siccum. | |
| | 2. Extractum Aloes. | |
| | 3. Extractum Cascaræ Sagradæ Siccum. | |
| | 4. Extractum Gentianæ. | |
| | 5. Extractum Glycyrrhizæ. | |
| | 6. Extractum Krameriæ. | |
| *C.* Fresh Extracts | 1. Extractum Colchici. | |
| | 2. Extractum Taraxaci. | |
| *D.* Abstracts | 1. Extractum Euonymi. | |
| | 2. Extractum Strophanthi. | |
| *E.* Compound Extract | Extractum Colocynthidis Compositum. | |

*What Preparation is made from Ext. Cannabis Indicæ?*

Tinctura Cannabis Indicæ, which is a solution of 1 part of Extract in 20 parts of Alcohol (90 per cent), dose 5 to 15 minims.

*Name the Lozenges prepared from Ext. Krameriæ.*

Trochiscus Krameriæ, containing 1 grain of Extract in each.
Trochiscus Krameriæ et Cocainæ, each containing 1 grain of Extract and $\frac{1}{20}$ grain of Cocaine Hydrochloride.

*What is the Composition of the "Compound" Extract?*

Colocynth pulp, Cardamoms, Soap, Scammony resin, Aloes extract, Alcohol (note initial formula, $C_2$ $S_2$ $A_2$).

*Define an "Abstract."*

In is an extract, in the preparation of which the percolated residue is dried and mixed with an inert powder to prevent agglutination.

*Which inert powders are used?*

1. Calcium Phosphate, for Extractum Euonymi and Ext. Nucis Vom.
2. Milk Sugar, for Extractum Strophanthi.

*What is Peculiar about the Preparation of Extractum Strophanthi?*

As the seeds contain a fixed oil, this is first removed by percolation with ether, the latter being then evaporated.

*How are "Fresh" Extracts prepared?*

By evaporation of the juice expressed from the fresh underground portion of the plant.

*Give the Alkaloidal Strengths of the Standardized Extracts.*

1. Extractum Belladonnæ Siccum = 1 per cent.
2. Extractum Hyoscyami = ·3 per cent.
3. Extractum Nucis Vomicæ Siccum = 5 per cent.
4. Extractum Opii Siccum = 20 per cent.

*Into what Preparations does Extractum Aloes enter?*

Extractum Colocynthidis Compositum.
Decoctum Aloes Compositum.

*Name the Preparation made from Extractum Ergotæ.*

Injectio Ergotæ Hypodermica.

*State the Doses of the Following Extracts.*

Extractum Cannabis Indicæ
Extractum Belladonnæ Siccum
Extractum Nucis Vomicæ Siccum
Extractum Opii Siccum
Extractum Colchici
Extractum Strophanthi
} dose, $\frac{1}{4}$ to 1 grs.

Extractum Euonymi, dose 1 to 2 grains.
Extractum Aloes, dose 1 to 4 grains.

Extractum Ergotæ
Extractum Cascaræ Sagradæ Siccum
Extractum Colocynthidis Compositum
Extractum Gentianæ
Extractum Hyoscyami
Extractum Rhei
} dose, 2 to 8 grs.

Extractum Glycyrrhizæ
Extractum Krameriæ
Extractum Taraxaci
} dose, 5 to 15 grs.

*Why is Alcohol added to the Liquid Extracts?*

1. To prevent decomposition.
2. To precipitate albuminous matter.

*Classify the Liquid Extracts according to their Menstrua.*

*A.* Aqueous
1. Extractum Agropyri Liquidum.
2. Extractum Belæ Liquidum.
3. Extractum Glycyrrhizæ Liquidum.

*B.* Alcoholic
1. Extractum Gossypii Radicis Corticis Liquidum.
2. Extractum Hamamelidis Liquidum.
3. Extractum Kavæ Liquidum.
4. Extractum Picrorhizæ Liquidum.
5. Extractum Viburni Liquidum.
6. Extractum Hydrastis Liquidum.
7. Extractum Ipecacuanhæ Liquidum. } Standardized.
8. Extractum Nucis Vomicæ Liquidum. } Standardized.

*C.* Aqueous and Alcoholic
1. Extractum Belladonnæ Liquidum. } Standardized.
2. Extractum Cinchonæ Liquidum. } Standardized.
3. Extractum Opii Liquidum. } Standardized.
4. Extractum Cascaræ Sagradæ Liquidum.
5. Extractum Ergotæ Liquidum.
6. Extractum Grindeliæ Liquidum.

*D.* Ethereal
Extractum Filicis Liquidum.

*Is "Oil of Male Fern" standardized, and what is its Dose?*

Yes; it must contain not less than 20 per cent. Filicin. The dose is 45 to 90 minims; but 2, or even 3, drams are often given.

*What Liquid Extract has no Dose? Give its Preparations.*

Extractum Belladonnæ Liquidum. Strength ·75 per cent. alkaloids.

1. Emplastrum Belladonnæ = ·25 per cent. alkaloids.
2. Linimentum Belladonnæ = ·375 per cent. alkaloids.
3. Unguentum Belladonnæ = ·6 per cent. alkaloids
4. Suppositoria Belladonnæ, each contains $\frac{1}{60}$ grain alkaloids.

*Mention the Strengths and Doses of the Remaining Standardized Extracts*

1. Extractum Cinchonæ Liquidum = 5 per cent. alkaloids. Dose 5 to 15 minims

2. Extractum Hydrastis Liquidum = 2 per cent. alkaloids. Dose 5 to 15 minims.

3. Extractum Ipecacuanhæ Liquidum = 2 per cent. alkaloids. Dose ½ to 2 minims.

4. Extractum Nucis Vomicæ Liquidum = 1·5 per cent. alkaloids. Dose 1 to 3 minims.

5. Extractum Opii Liquidum = ·75 per cent alkaloids. Dose 5 to 30 minims.

*What are the Doses of the Remaining Extracts?*

Extractum Hamamelidis Liquidum, 5 to 15 minims.
Extractum Grindeliæ Liquidum, 10 to 20 minims.
Extractum Ergotæ Liquidum, 10 to 30 minims.
Extractum Agropyri Liquidum. 1 to 2 drams.
Extractum Belæ Liquidum, 1 to 2 drams.
Extractum Viburni Liquidum, 1 to 2 drams.
All the remainder, ½ to 1 dram.

*Name the Liquid Extract prepared from Dry Extract, and the Tincture prepared from the former.*

Extractum Opii Liquidum.
Tinctura Nucis Vomicæ.

*What Preparation is made from Ext. Ipecac. Liq.?*

Vinum Ipecacuanha, which contains ·1 per cent. alkaloids.

*Give the Composition of Ext. Cinchonæ Liq., and explain the Use of the Acid.*

Powdered Cinchonæ; Hydrochloric Acid; Glycerin; Alcohol; Water.

The HCl. is used, so that the alkaloids (which are insoluble) extracted by the maceration may be converted into soluble salts.

## GLYCERINA.

*Describe these Preparations.*

They are solutions of various drugs in Glycerin ; all being for external application, except Glycerinum Pepsini (dose 1 to 2 drams), and Glycerinum Tragacanthæ, which is used as a pill excipient.

*What are their Physical Characters?*

Glycerinum Amyli and Glycerinum Tragacanthæ are semi-solid ; all the remainder are liquid.

*Mention those that are Official.*

1. Glycerinum Acidi Borici.
2. Do. Acidi Carbolici.
3. Do. Acidi Tannici.
4. Do. Aluminis.
5. Do. Amyli.
6. Do Boracis.
7. Do. Pepsini.
8. Do. Plumbi Subacetatis.
9. Do. Tragacanthæ.

*How is Glycerinum Pepsini prepared?*

Pepsin is macerated for one week in a mixture of Glycerin, Water, and a little Hydrochloric Acid, and the liquid is then filtered. It contains 10 per cent. Pepsin.

## INFUSA.

*Define an Infusion?*

It is an aqueous solution, containing the active principles of a drug, made by pouring boiling distilled water on the crude drug in a state of comminution, then covering up the vessel, agitating from time to time and straining, after a stated period. The strained liquid is the infusion.

# MATERIA MEDICA.

## PART III.

## OFFICIAL PREPARATIONS—*continued.*

### INFUSA—*continued.*

*How does this Process differ from that of Maceration?*

In maceration the temperature of the water is normal, and the residue of the drug is expressed.

*What Infusions are made with Cold Water, and why?*

1. Infusum Calumbæ, to prevent solution of the starch in the drug.
2. Infusum Quassiæ, to prevent solution of too much bitter principle.

*Name the Infusions which contain more than One Drug in their Composition.*

1. Infusum Aurantii Compositum, contains orange peel, lemon peel, and cloves.
2. Infusum Cinchonæ Acidum, contains red cinchona bark, and aromatic sulphuric acid.
3. Infusum Gentianæ Compositum, contains gentian, orange peel, and lemon peel.
4. Infusum Rosæ Acidum, contains dried rose petals, and dilute sulphuric acid.
5. Infusum Sennæ, contains senna and ginger.

*Give the Dose of an Infusion.*

The doses of all infusions are ½ to 1 ounce, except

| | |
|---|---|
| Infusum Buchu<br>Infusum Ergotæ<br>Infusum Scoparii | Dose 1 to 2 ounces. |
| Infusum Digitalis. | Dose 2 to 4 drams. |

## INJECTIONES HYPODERMICÆ.

*Name those that are Official.*

1. Injectio Apomorphinæ Hypodermica.
2. Injectio Cocainæ Hypodermica.
3. Injectio Ergotæ Hypodermica.
4. Injectio Morphinæ Hypodermica.
5. Injectio Strychninæ Hypodermica.

*How should the Official Injections be prepared?*

They should be made with recently boiled distilled water, and kept in well corked bottles, previously washed with boiling water.

*State the Composition and Strength of each Injection and its Dose.*

1. Apomorphine contains 1 per cent. Apomorphinæ Hydrochloridum, with a little dilute Hydrochloric Acid added, to preserve it.
2. Cocaine contains 5 per cent. Cocainæ Hydrochloridum, with a little Salicylic Acid added, to preserve it.
3. Ergot contains 33 per cent. Extractum Ergotæ, with a little Carbolic Acid added, to preserve it.
4. Morphia contains 2·5 per cent. Morphinæ Tartras.
5. Strychnine contains ·75 per cent. Strychninæ Hydrochloridum.

Each has a similar dose, viz. 5 to 10 minims.

## LAMELLÆ.

*What is a Lamella?*

A small disc consisting of an optic medicament and a basis of gelatin, with which is incorporated a little glycerin.

*Name the Official Lamellæ with their Strengths.*

1. Lamella Atropinæ, each contains $\frac{1}{5000}$ grain of Atropinæ Sulphas.
2. Lamella Cocainæ, each contains $\frac{1}{50}$ grain of Cocainæ Hydrochloridum.
3. Lamella Homatropinæ, each contains $\frac{1}{100}$ grain Homatropinæ Hydrobromidum.
4. Lamella Physostigminæ, each contains $\frac{1}{1000}$ grain Physostigminæ Sulphas.

## LINIMENTA.

*Define a Liniment.*

An oily or spirituous compound for application to the skin, and intended to be either, simply applied to it (*e.g.* Linimentum Calcis), or painted on it, (*e.g.* Linimentum Aconitum), or well rubbed in.

*What Official Liniments contain no Camphor?*

Liniments of Croton, Lime, Ammonia, and Potassium Iodide.

*Which Liniment is not a Liquid?*

Linimentum Potassii Iodidi cum Sapone, is the consistence of "Shaving Cream." It has an odour of lemons.

*Name the "Standardized" Liniments.*

Linimentum Aconiti contains ·2 per cent. Alkaloids.
Linimentum Belladonnæ contains ·375 per cent. Alkaloids.

*What other Liniment contains an Alkaloid?*

Linimentum Opii contains ·5 per cent. Morphine, but is not standardized.

*Mention the Liniments that are in the form of an Emulsion.*

Linimentum Ammoniæ.
Linimentum Calcis.
Linimentum Terebinthinæ.

## LIQUORES.

*What is a "Liquor"?*

A solution generally of a definite chemical substance, the solvent being usually distilled water.

*Enumerate, with Doses, the Liquors having a Strength of* 1 *per cent.*

1. Liquor Atropinæ Sulphatis, dose ½ to 1 minim.
2. Liquor Trinitrini, dose ½ to 2 minims.
3. Liquor Arsenicalis,
4. Liquor Arsenicalis Hydrochloricus,
5. Liquor Sodii Arsenatis,
6. Liquor Strychninæ Hydrochloridi,

   dose 2 to 8 minims.
7. Liquor Arsenii et Hydrargyri Iodidi, dose 5 to 20 minims.
8. Liquor Morphinæ Acetatis,
9. Liquor Morphinæ Hydrochloridi,
10. Liquor Morphinæ Tartratis.

    dose 10 to 60 minims.
11. Liquor Potassii Permanganatis, dose 2 to 4 drams.

*Why are there two "Arsenical" Liquors?*

Liquor Arsenicalis or "Fowler's Solution" is an alkaline liquor, to be prescribed with alkalies. It is coloured pink with compound tincture of lavender, to distinguish it from the acid liquor, which is colourless, and should only be prescribed in acid mixtures.

*What is "Donovan's Solution"?*

Liquor Arsenii et Hydrargyri Iodidi. (*N.B.*—The maximum dose of this contains $\frac{1}{5}$ grain red iodide of mercury, the maximum dose of which is $\frac{1}{16}$ grain.)

*Which Liquors are obtained from the Animal Kingdom?*

1. Liquor Adrenalini Hydrochloricus, dose 10 to 30 minims.
2. Liquor Epispasticus.
3. Liquor Pancreatis, dose 1 to 2 drams.

*How is Liquor Pancreatis prepared?*

The fresh Pancreas of the Pig is freed from fat and external membrane, finely triturated with washed sand, digested in a closed vessel in a solution of alcohol, glycerin, and water for seven days, and then filtered.

It should contain 25 per cent. Pancreas, and is most active when the animal from which it has been obtained has been fed shortly before being killed.

*What is its Action?*

It acts only in the presence of alkalies, converting starch into sugar, albumin and fibrin into peptones, and peptonising milk.

*Mention the "Iron" Liquors.*

1. Liquor Ferri Perchloridi Fortis.
2. Liquor Ferri Perchloridi, dose 5 to 15 minims.
3. Liquor Ferri Persulphatis.

*What is Liquor Ferri Persulphatis chiefly used for?*

In the manufacture of the scale preparations of iron, the base of which is ferric hydrate, obtained by the interaction of this liquor with solution of ammonia.

*Specify the Liquors containing Ammonia.*

1. Liquor Ammoniæ Fortis.
2. Liquor Ammoniæ.
3. Liquor Ammonii Acetatis, } dose 2 to 6 drams.
4. Liquor Ammonii Citratis, }
5. Liquor Bismuthi et Ammonii Citratis, dose ½ to 1 dram.

*What is the Composition of Liquor Bismuthi?*

Bismuth Subnitrate, Potassium Citrate, Potassium Carbonate, Nitric Acid, Solution of Ammonia, Distilled Water.

*Enumerate the "Lime" Liquors.*

1. Liquor Calcis.
2. Liquor Calcis Saccharatus, dose 15 to 60 minims.
3. Liquor Calcis Chlorinatæ.
4. Liquor Sodæ Chlorinatæ, dose 10 to 20 minims.

*What is the Advantage of Saccharated Lime Water?*

The sugar assists in dissolving the calcium hydroxide, so that this solution is twenty times stronger than liquor calcis, and is more palatable.

*State the Liquors containing Chlorine.*

1. Liquor Calcis Chlorinatæ, yields 3 per cent. of Chlorine.
2. Liquor Sodæ Chlorinatæ, yields 2·5 per cent. of Chlorine.

*Mention the "Lead" Liquors.*

1. Liquor Plumbi Subacetatis Fortis, or Goulard's Extract.
2. Liquor Plumbi Subacetatis Dilutus, or Goulard's Lotion.

*Name the Preparations obtained from Goulard's Extract.*

Glycerinum Plumbi Subacetatis.
Unguentum Plumbi Subacetatis.

*What Liquors contain Mercurial Salts?*

1. Liquor Hydrargyri Nitratis Acidus is a solution of Mercuric Nitrate in Nitric Acid.
2. Liquor Hydrargyri Perchloridi, ·1 per cent., dose ½ to 1 dram.
3. Liquor Arsenii et Hydrargyri Iodidi is a 1 per cent. solution of mercuric iodide, dose 5 to 20 minims (*vide* Donovan's solution).

*Mention an "Effervescing" Liquor.*

Liquor Magnesii Bicarbonatis or "Fluid Magnesia" is an aqueous solution of magnesium carbonate into which is passed carbonic acid gas under a pressure of three atmospheres.

*Name another Liquor which contains a Gas and give its use.*

Liquor Hydrogenii Peroxidi is an aqueous solution of peroxide of hydrogen, containing ten times its volume of oxygen, dose ½ to 2 drams.

As it easily parts with oxygen it is a powerful antiseptic, but its instability is a disadvantage.

*How is Liquor Picis Carbonis prepared?*

Quillaia bark is percolated with 90 per cent. alcohol, and prepared coal tar is added to the percolate.

*What is the Composition of Liquor Cresol Saponatus?*

Cresol, Castor Oil, Potassium Hydroxide, Water.

*Describe "Formalin," and give its Uses.*

It is liquor formaldehydi, and is an aqueous solution containing 37 per cent. of formaldehyde. From it is prepared liquor formaldehydi saponatus.

Formalin is a powerful caustic, an aqueous solution (1 in 10), being used to destroy corns. It is also germicidal, and has been employed for ringworm.

For ulcerative stomatitis, a ·2 per cent. solution is efficacious as an antiseptic.

It is a powerful disinfectant, and does not destroy coloured fabrics.

It is used histologically as a preservative and hardening agent.

*Mention some other Caustic Liquors.*

Liquor Acidi Chromici, Liquor Zinci Chloridi.
These also possess antiseptic properties.

*Give the Composition and Strength of Liquor Epispasticus.*

Cantharidin, Castor Oil, Resin, Acetone.
It contains ·4 per cent. of Cantharidin.

*What Liquor is obtained by Distillation?*

Liquor Hamamelidis is obtained by distillation from the fresh leaves.

## LOTIONES.

*Name those Official, stating Composition and Active Ingredient.*

1. Lotio Hydrargyri Flava or "Yellow Wash" contains 2 grains of mercuric chloride in 1 ounce of lime water. The active ingredient is yellow oxide of mercury.
2. Lotio Hydrargyri Nigra or "Black Wash" contains 3 grains of calomel in 1 ounce of lime water, with a little glycerin added.

The active ingredient is black mercurous oxide.

*What is Lotio Rubra?*

It contains generally about 2 grains of sulphate of zinc in 1 ounce of water, coloured red with compound tincture of lavender. It is not official.

## MELLA.

*Enumerate, with Doses, the Official Preparations containing Honey.*

1. Mel Depuratum is commercial honey melted and clarified.
2. Mel Boracis contains borax, glycerin, and clarified honey.
3. Oxymel is clarified honey containing diluted acetic acid, dose 1 to 2 drams.
4. Oxymel Scillæ contains clarified honey and vinegar of squill, dose ½ to 1 dram.
5. Oxymel Urgineæ contains clarified honey and vinegar of urginea, dose ½ to 1 dram.
6. Confectio Piperis also contains clarified honey, dose 60 to 120 grains.

## MISTURÆ.

*What is the Composition, Dose, and Active Ingredient of "Black Draught"?*

"Black Draught," or Mistura Sennæ Composita, contains aromatic spirit of ammonia, liquid extract of liquorice, infusion of senna, compound tincture of cardamoms, epsom salts.

The dose is 1 to 2 ounces, and the active ingredient is epsom salts.

*Describe "Griffith's Mixture," and state Dose and Composition.*

It is Mistura Ferri Composita, and is an unstable preparation as the ferrous carbonate formed in it, is liable to become oxidised.

Its dose is ½ to 1 ounce, and it is composed of ferrous sulphate, potassium carbonate, myrrh, glucose, gum acaciæ, spirit of nutmeg, and rose water.

*Give the Composition of Mistura Olei Ricini.*

Castor oil, undiluted orange flower water, acacia, cinnamon water.

Dose 1 to 2 ounces.

*What is peculiar about Mistura Ammoniaci?*

It consists of syrup of tolu, water and ammoniacum. The latter being a gum-resin, the gum dissolves and suspends the resin, forming an emulsion.

*Name the remaining "Misturæ," with Dose of each.*

Mistura Amygdalæ, Mistura Cretæ, Mistura Guaiaci. Each has a similar dose, viz. ½ to 1 ounce.

## MUCILAGINES.

*Name those Official and state their Uses.*

1. Mucilago Acaciæ.
2. Mucilago Gummi Indici.
3. Mucilago Tragacanthæ.

Being aqueous, viscid solutions of gums they are used to suspend insoluble substances in mixtures. They have no stated dose.

## PILULÆ.

*Mention the Official Pills containing Aloes.*

1. Pilula Aloes,
2. Pilula Aloes et Asafetidæ,
3. Pilula Aloes et Ferri,
4. Pilula Aloes et Myrrhæ,
5. Pilula Colocynthidis Composita,
6. Pilula Colocynthidis et Hyoscyami,
7. Pilula Rhei Composita,

} dose 4 to 8 grains.

*What is the Composition of Compound Colocynth Pill?*

Water, colocynth pulp, scammony resin, oil of cloves, aloes, potassium carbonate.

*How would you distinguish the foregoing Pills?*

By smelling them.

Pilula Aloes contains oil of caraway.

Pilula Aloes et Asafetidæ, the latter has a characteristic odour.

Pilula Aloes et Ferri contains compound cinnamon powder.

Pilula Aloes et Myrrhæ is recognised by the odour of the myrrh.

Pilula Colocynthidis Composita contains oil of cloves.

Pilula Rhei Composita contains oil of peppermint.

*State the Composition, Dose, and Active Ingredient of "Blaud's" Pill.*

Pilula Ferri contains exsiccated ferrous sulphate, exsiccated sodium carbonate, gum acacia, tragacanth, glucose, and water.

The dose is 5 to 15 grains and the active ingredient is ferrous carbonate, which is formed by chemical action similar to what occurs in mistura ferri composita.

*Mention the Pills containing Opium, stating the Dose and Amount of Morphine in each.*

1. Pilula Ipecacuanhæ cum Scilla, 4 to 8 grains, ·5 per cent. morphine.
2. Pilula Ipecacuanhæ cum Urginea, 4 to 8 grains, ·5 per cent. morphine.
3. Pilula Plumbi cum Opio, 2 to 4 grains, 1·2 per cent. morphine.
4. Pilula Saponis Composita, 2 to 4 grains, 2 per cent. morphine.

*How would you calculate the Amount of Opium in each Pill?*

Official opium must contain 10 per cent. morphine, so if each of the above amounts of morphine is multipled by ten, the amount of opium is obtained.

*Name the "Mercurial" Pills and state how you would distinguish them.*

1. Pilula Hydrargyri, also called "Blue Pill" on account of its colour.
2. Pilula Hydrargyri Subchloridi Composita, also called "Plummer's" pill, contains calomel, sulphuretted antimony, guaiacum, gum acacia, tragacanth and syrup of glucose, and is distinguished by the orange colour of the sulphuretted antimony.

Both have the same dose, 4 to 8 grains.

*What is the Composition, Strength, and Dose of Pilula Phosphori?*

It consists of phosphorus, oil of theobroma, wool fat, kaolin, sodium sulphate, carbon disulphide, and contains 1 per cent. phosphorus.

Dose 1 to 4 grains.

*Name the remaining Official Pills with the Dose of each.*

Pilula Quininæ Sulphatis, dose 2 to 8 grains.
Pilula Scillæ Composita, dose 4 to 8 grains.
Pilula Urgineæ Composita, dose 4 to 8 grains.

## PULVERES.

*Mention, with Strengths and Doses, the Official Powders containing Opium.*

1. Pulvis Cretæ Aromaticus cum Opio, 2·5 per cent. opium. Dose 10 to 60 grains.
2. Pulvis Ipecacuanhæ Compositus, 10 per cent. opium. Dose 5 to 15 grains.
3. Pulvis Kino Compositus, 5 per cent. opium. Dose 5 to 20 grains.
4. Pulvis Opii Compositus, 10 per cent. opium. Dose 5 to 15 grains.

*What is the Composition of "Dover's Powder"?*

Pulvis Ipecacuanhæ Compositus is composed of ipecacuanha, opium, and sulphate of potassium; the latter being a hard and heavy powder ensures proper mixing of the other substances

*Describe "Aromatic" Powder.*

It is NOT Pulvis Cretæ Aromaticus, but is another name for Pulvis Cinnamomi Compositus, and is composed of cinnamon, ginger, and cardamoms. Dose 10 to 60 grains.

*What is the Composition of Pulvis Cretæ Aromaticus?*

Prepared chalk, cinnamon, cloves, cardamoms, nutmeg, and sugar. Dose 10 to 60 grains.

*N.B.*—The foregoing powders have an astringent action.

*Mention another "Astringent" Powder.*

Pulvis Catechu Compositus, which contains catechu, cinnamon, kino, krameria, nutmeg, and has a dose 10 to 60 grains.

*Enumerate the "Purgative" Powders.*

1. Pulvis Glycyrrhizæ Compositus, dose 60 to 120 grains.
2. Pulvis Jalapæ Compositus,
3. Pulvis Kaladanæ Compositus, } dose 10 to 60 grains.
4. Pulvis Rhei Compositus,
5. Pulvis Scammoniæ Compositus, dose 10 to 20 grains.

*Give the Composition of Compound Liquorice Powder.*

Liquorice, fennel, senna, sublimed sulphur, sugar.

*What is "Gregory's Powder"?*

Compound Rhubarb Powder containing rhubarb, magnesia, ginger.

*Give the Contents of the remaining Purgative Powders.*

Compound Jalap Powder contains jalap, cream of tartar, ginger.

Compound Kaladana Powder contains kaladana, cream of tartar, ginger.

Compound Scammony Powder contains scammony resin, jalap, ginger.

*What is "James's Powder"?*

Pulvis Antimonialis, consisting of antimonious oxide and calcium phosphate. Dose 3 to 6 grains.

## PULVERES EFFERVESCENTES.

*Define these Preparations.*

They are granular effervescent powders, composed of a basis of citric and tartaric acids with sodium bicarbonate, and usually containing an added medicament. The granulation is produced by heating the mixed powders to 220°F., with constant stirring, and passing the resulting mixture through sieves.

*Mention those Official, stating Dose and Amount of Added Medicament.*

1. Lithii Citras Effervescens, contains 5 per cent. lithii citras. Dose 60 to 120 grains.
2. Sodii Sulphas Effervescens, contains 50 per cent. sodii sulphas. Dose 60 to 240 grains.
3. Sodii Phosphas Effervescens, contains 50 per cent. sodii phosphas. Dose 60 to 240 grains.
4. Caffeinæ Citras Effervescens, contains 4 per cent. caffeinæ citras. Dose 60 to 120 grains.
5. Magnesii Sulphas Effervescens, contains 50 per cent. magnesii sulphas. Dose 60 to 480 grains.
6. Sodii Citro Tartras Effervescens, consists solely of sugar, sodium bicarbonate, citric acid, tartaric acid. Dose 60 to 120 grains.

*Name another Effervescent Powder which is not granulated.*

Pulvis Sodæ Tartratæ Effervescens (Seidlitz Powder), which consists of 120 grains rochelle salt and 40 grains sodium bicarbonate mixed and wrapped in blue paper, and 38 grains tartaric acid wrapped in white paper.

## SAPONES.

*What is a Soap?*

It is a compound formed by the action of an alkaline hydroxide on a fat or a fixed oil.

*Mention those Official, with Method of Preparation.*

1. Sapo Animalis, or Curd Soap, is formed by the action of sodium hydroxide on purified animal fat.
2. Sapo Durus is formed by boiling sodium hydroxide and olive oil.
3. Sapo Mollis is formed by boiling potassium hydroxide and olive oil.

*State the Chemical Composition of these Soaps.*

Sapo Animalis is chiefly stearate of sodium.
Sapo Durus is sodium oleate.
Sapo Mollis is potassium oleate.

*Mention other Official Oleates or Stearates.*

1. Hydrargyrum Oleatum.
2. Zinci Oleostearas.

*State any Official Preparations containing Oleates.*

1. Linimentum Ammoniæ contains oleate of ammonium.
2. Linimentum Calcis contains oleate of calcium.
3. Emplastrum Plumbi contains oleate of lead.
4. Unguentum Hydrargyri Oleati.
5. Unguentum Zinci Oleatis.

## SPIRITÛS.

*What Official Spirits are obtained by Distillation?*

1. Spiritus Ætheris Nitrosi, dose 15 to 60 minims.
2. Spiritus Ammoniæ Aromaticus, dose 20 to 60 minims, 60 to 90 minims.
3. Spiritus Ammoniæ Fetidus, dose 20 to 60 minims, 60 to 90 minims.
4. Spiritus Armoraciæ Compositus, dose 1 to 2 drams.
5. Spiritus Rectificatus.

*Give the Preparation of Spiritus Ætheris Nitrosi.*

Sweet Spirit of Nitre is a solution containing 2·5 per cent. of ethyl nitrite. It is prepared by distilling a mixture of alcohol, sulphuric acid, nitric acid, and copper (the latter acting as a reducing agent), and dissolving the distillate in alcohol.

*How is Spirit of Salvolatile prepared?*

By dissolving ammonium carbonate and strong solution of ammonia in the distillate obtained from a mixture of oils of lemon and nutmeg in alcohol.

*What is the Composition of Spiritus Ammoniæ Fetidus?*

The distillate obtained from a mixture of asafetida and alcohol is mixed with strong solution of ammonia and alcohol.

*How is Spiritus Armoraciæ Compositus prepared?*

By distilling a mixture of scraped horseradish root, bitter orange peel, nutmeg, alcohol, and water.

*Enumerate, with Doses, the remaining Spirits.*

1. Spiritus Ætheris, dose 20 to 40 minims, 60 to 90 minims.
2. Spiritus Chloroformi, dose 5 to 20 minims, 30 to 40 minims.

3. Spiritus Anisi,
4. Spiritus Cajuputi,
5. Spiritus Camphoræ,
6. Spiritus Cinnamomi,
7. Spiritus Juniperi,
8. Spiritus Lavandulæ,
9. Spiritus Menthæ Piperitæ,
10. Spiritus Myristicæ,

} dose 5 to 20 minims.

11. Spiritus Rosmarini, no dose.

*Indicate the Peculiarity of these Preparations.*

They are all simple solutions of volatile substances in alcohol.

## SUCCI.

*Describe Juices.*

They are liquids obtained by expression from various parts of fresh plants, to which (except Succus Limonis) a third of their volume of alcohol is added to preserve them.

*Give the Composition of Succus Limonis and its Uses.*

It is freshly expressed from the ripe fruit of Citrus medica, and contains Citric Acid (free and combined), Malic Acid, Phosphoric Acid.

It is used as a source of Citric Acid, and also in the preparation of Syrupus Limonis.

*What is Succus Scoparii?*

It is the juice obtained from fresh broom tops, with the addition of alcohol. Dose 1 to 2 drams.

*Mention the Source and Dose of Succus Taraxaci.*

Fresh Dandelion Root. Dose 1 to 2 drams.

## SUPPOSITORIA.

*Define a Suppository.*

It is a small solid conical substance containing an active medicament for introduction into the rectum or vagina.

*Mention the Alkaloidal Suppositories.*

1. Suppositoria Belladonnæ, each contains $\frac{1}{60}$ grain Alkaloids.
2. Suppositoria Morphinæ, each contains $\frac{1}{4}$ grain Morphine.
3. Suppositoria Plumbi Composita, each contains $\frac{1}{10}$ grain Morphine.

*Of what Strength are the remaining Suppositories?*

1. Suppositoria Acidi Carbolici, each contains 1 grain.
2. Suppositoria Acidi Tannici, each contains 3 grains.
3. Suppositoria Glycerini, each contains 70 per cent.
4. Suppositoria Iodoformi, each contains 3 grains.

*What is the Weight and Basis of an Official Suppository?*

Each must weigh 15·432 grains (1 gramme), and the basis of each is oleum theobromæ, except the glycerin suppository, the basis of which is gelatin.

## SYRUPI.

*Mention, with Strength and Dose, the Syrups containing Iron.*

1. Syrupus Ferri Iodidi, contains 7 per cent. ferrous iodide.
2. Syrupus Ferri Phosphatis, contains 1·8 per cent. anhydrous ferrous phosphate.
3. Syrupus Ferri Phosphatis cum Quinina et Strychnina, contains in each dram $\frac{1}{32}$ grain strychnine, $\frac{1}{8}$ grain quinine sulphate, 1 grain anhydrous ferrous phosphate.

The dose of each is $\frac{1}{2}$ to 1 dram.

*Is Syrupus Ferri Iodidi a Stable Preparation?*

No; its composition is soon altered by the formation of oxyiodide of iron and free iodine, which makes it yellow. This yellow colour can be dispelled by exposure to direct sunlight, the iodine being then converted into hydriodic acid.

*What other Syrup contains a Compound of Iodine?*

Syrupus Acidi Hydriodici, dose ½ to 1 dram.

*Mention a "Balsamic" Syrup.*

Syrupus Tolutanus, dose ½ to 1 dram.

*Give the Composition of Syrupus Calcii Lactophosphatis.*

Calcium Lactate, Concentrated Phosphoric Acid, Orange-flower Water, Sugar, Distilled Water. Dose ½ to 1 dram.

*What is peculiar about this Syrup?*

It is made without heat.

*Mention any other Syrup made without Heat, and why.*

Syrupus Pruni Virginianæ; the heat would drive off the small quantity of prussic acid, which is formed by the active principles (amygdalin and emulsin) of the prune bark.

*What is the Strength and Dose of Syrupus Codeinæ Phosphatis?*

It contains ·5 per cent. codeine phosphate, dose ½ to 2 drams.

*Mention a Syrup with Hypnotic Properties.*

Syrupus Chloral; contains 20 per cent. Chloral Hydrate, dose ½ to 2 drams.

*What Syrups contain Acetic Acid?*

Syrupus Scillæ.
Syrupus Urgineæ. Dose of each ½ to 1 dram.

*Mention, with Dose, the "Purgative" Syrups.*

1 Syrupus Cascaræ Aromaticus,
2. Syrupus Rhei,
3. Syrupus Sennæ,
} dose ½ to 2 drams.

*What is the Dose of each of the remaining Syrups?*

½ to 1 dram.

## TINCTURÆ.

*Describe, with Examples, some of the Processes employed in the Manufacture of Tinctures.*

1. *Percolation.*—The drug, in a comminuted state, is moistened with a certain quantity of menstruum for four hours, packed in a percolator, and sufficient menstruum added to saturate it and leave a layer of liquid above. This is set aside for twenty-four hours, and then the liquid is allowed to drop slowly from the percolator until three-fourths of the required quantity of tincture is obtained. The residue in percolator (the marc) is then pressed, and the expressed liquid added to the previous quantity. The mixed liquids are filtered, and enough menstruum added to make the prescribed volume of tincture. Finally, the tincture is clarified by subsidence or filtration. Example—Tinctura Buchu.

2. *Maceration.*—The drug, in a comminuted state, is placed in a closed vessel with the whole of the menstruum for seven days, and occasionally shaken. It is then strained, the marc is pressed, and the strained and pressed liquids are mixed. Example—Tinctura Opii.

3. *Simple mixing* or solution of ingredients. Example—Tinctura Quininæ, Tinctura Ferri Perchloridi.

*Into what Three Groups may Tinctures be divided?*

1. Simple, *i.e.* those consisting of a solution of the active principles of the drug in an alcoholic menstruum.
2. Compound, *i.e.* those consisting of a solution of the active principles of two or more drugs in an alcoholic menstruum, and officially called compound.
3. Complex, *i.e.* similar to preceding, but not officially called compound.

*Enumerate, with Strength and Dose, the Simple Alkaloidal Tinctures.*

1. Tinctura Aconiti, ·04 per cent. alkaloids. Dose 2 to 5 minims.
2. Tinctura Belladonnæ, ·035 per cent. alkaloids. Dose 5 to 15 minims.
3. Tinctura Cinchonæ, 1 per cent. alkaloids. Dose ½ to 1 dram.
4. Tinctura Nucis Vomicæ, ·125 per cent. alkaloids. Dose 5 to 15 minims.
5. Tinctura Opii, 1 per cent. alkaloids. Dose 5 to 15 minims.
6. Tinctura Quininæ, 2 per cent. alkaloids. Dose ½ to 1 dram.

*Mention another Simple Standardised Tincture.*

Tinctura Jalapæ contains 1·5 per cent. resin, dose ½ to 1 dram.

*What is the Strength, Composition, and Dose of Tinctura Cantharidini?*

It is composed of ·01 per cent. cantharidin with chloroform and alcohol, dose 2 to 5 minims.

*What Simple Tinctures are prepared with an Æthereal Menstruum?*

Tinctura Lobeliæ Ætherea, dose 5 to 15 minims.
Tinctura Strophanthi, dose 2 to 5 minims.

*What Precaution should be taken in prescribing Tinctura Cannabis Indicæ, and what is its Dose?*

As there is a bulky precipitation of resin on the addition of water, some mucilage of acacia should be added to suspend it.

It is a simple solution of the extract in 90 per cent. alcohol, dose 5 to 15 minims.

*From what other Simple Tinctures does Water precipitate the Resin?*

Tinctura Jalapæ, Tinctura Kaladanæ, Tinctura Podophylli, Tinctura Podophylli Indici.

*Mention, with Dose, a Simple Inorganic Tincture.*

Tinctura Ferri Perchloridi. Dose 5 to 15 minims.

*What other Simple Tinctures have a similar Dose?*

Tinctura Capsici, Tinctura Cocci, Tinctura Colchici, Tinctura Daturæ Seminum, Tinctura Digitalis, Tinctura Gelsemii, Tinctura Podophylli, Tinctura Podophylli Indici, Tinctura Scillæ, Tinctura Stramonii, Tinctura Urgineæ.

*Enumerate the "Compound" Alkaloidal Tinctures.*

1. Tinctura Camphoræ Composita, ·05 per cent. morphine. Dose ½ to 1 dram.
2. Tinctura Chloroformi et Morphinæ Composita, contains, in ten minims, $\frac{1}{11}$ grain morphine hydrochloride, ¾ minim chloroform, ½ minim dilute hydrocyanic acid. Dose 5 to 15 minims.
3. Tinctura Cinchonæ Composita, ·5 per cent. alkaloids.

*What are the "Paregoric" Tinctures?*

Tinctura Camphoræ Composita is "Paregoric Elixir."
Tinctura Opii Ammoniata is "Scotch Paregoric."

*What is the Composition and Dose of Tinctura Benzoini Composita?*

Storax, tolu, aloes, benzoin, spirit. Dose ½ to 1 dram.

*What are the Doses of the remaining Compound Tinctures?*

The dose of each is ½ to 1 dram.

*Mention the "Ammoniated" Tinctures.*

1. Tinctura Ergotæ Ammoniata.
2. Tinctura Guaiaci Ammoniata.
3. Tinctura Opii Ammoniata.
4. Tinctura Quininæ Ammoniata.
5. Tinctura Valerianæ Ammoniata.
6. Tinctura Valerianæ Indicæ Ammoniata.

The dose of each is ½ to 1 dram.

*What is the Composition of Tinctura Opii Ammoniata?*

Benzoic Acid, Oil of Anise, Alcohol, Solution of Ammonia, Tincture of Opium. It contains ·1 per cent. morphine.

*Give the Alkaloidal Strength of Tinctura Quininæ Ammoniata?*

Two per cent.

*Mention the remaining "Complex" Tinctures?*

1. Tinctura Iodi Fortis.
2. Tinctura Iodi Mitis. Dose 2 to 5 minims.

These are both inorganic, and each contains iodine, potassium iodide, alcohol, and water. The former containing 10 per cent., the latter 2·5 per cent. of iodine.

## TROCHISCUS.

*What are the Official Lozenge Bases?*

1. Fruit basis consisting of sugar, tragacanth, black currant paste.
2. Rose basis consisting of sugar, tragacanth, oil of rose.
3. Simple basis consisting of sugar, gum acacia.
4. Tolu basis consisting of sugar, gum acacia, tincture of tolu.

*Indicate the Composition of Trochiscus Bismuthi Compositus.*

Bismuth Carbonate, heavy magnesium carbonate, precipitated calcium carbonate, rose basis.

*What does Sulphur Lozenge contain?*

Precipitated sulphur, cream of tartar, tincture of orange, sugar, gum acacia, mucilage of acacia.

*Enumerate with Strengths, the Lozenges containing Alkaloids.*

1. Trochiscus Krameriæ et Cocainæ, each contains 1 grain extract of krameria, and $\frac{1}{20}$ grain cocaine hydrochloride.
2. Trochiscus Morphinæ, each contains $\frac{1}{32}$ grain morphine hydrochloride.
3. Trochiscus Morphinæ et Ipecacuanhæ, each contains $\frac{1}{10}$ grain ipecacuanha and $\frac{1}{32}$ grain morphine hydrochloride.

*What are the "Acid" Lozenges?*

1. Trochiscus Acidi Benzoici.
2. Trochiscus Acidi Carbolici.
3. Trochiscus Acidi Tannici.

Each contains $\frac{1}{2}$ grain of medicament.

*Classify the remaining Lozenges, according to their Strengths.*

1. Trochiscus Catechu
2. Trochiscus Ferri Redacti
3. Trochiscus Kino Eucalypti
4. Trochiscus Krameriæ
5. Trochiscus Santonini

} each contains 1 grain.

6. Trochiscus Guaiaci Resinæ
7. Trochiscus Potassii Chloratis

} each contains 3 grains.

8. Trochiscus Ipecacuanhæ, contains $\frac{1}{4}$ grain.

## UNGUENTA.

*Give the Various Bases used for Ointments.*

Lard; hard and soft paraffin; hydrous wool fat; spermaceti.

*When is it advisable to use Lard as a Basis?*

Lard, which melts at about the body temperature, should be used when it is required that the active ingredient should be absorbed.

*Mention the "Alkaloidal" Ointments.*

1. Unguentum Aconitinæ, contains 2 per cent. Aconitine.
2. Unguentum Atropinæ, contains 2 per cent. Atropine.
3. Unguentum Cocainæ, contains 4 per cent. Cocaine.
4. Unguentum Gallæ cum Opio, contains ·75 per cent. Morphine.
5. Unguentum Myrobalani cum Opio, contains ·75 per cent. Morphine.
6. Unguentum Belladonnæ, contains ·6 per cent. Alkaloids.

*Why is Oleic Acid used in the Preparation of Atropine, Aconitine, and Cocaine Ointments?*

As a solvent for the pure alkaloids, and to accelerate absorption.

*What is the Composition of Unguentum Belladonnæ?*

Liquid Extract of Belladonnæ; Wool fat; Benzoated Lard.

*Mention the Ointments containing Iodine.*

Unguentum Iodi.
Unguentum Iodoformi.
Unguentum Potassii Iodidi.

*How is Unguentum Zinci Oleatis prepared?*

By mixing a solution of Zinc Sulphate, and a solution of hard soap, drying the precipitated Zinc Oleate, and mixing it with an equal weight of white soft paraffin.

*Enumerate the "Mercurial" Ointments.*

1. Unguentum Hydrargyri (Blue Ointment).
2. Unguentum Hydrargyri Compositum (Scott's Dressing).
3. Unguentum Hydrargyri Ammoniati (White Precipitate Ointment).
4. Unguentum Hydrargyri Iodidi Rubri.
5. Unguentum Hydrargyri Nitratis (Citrine Ointment).
6. Unguentum Hydrargyri Nitratis Dilutum.
7. Unguentum Hydrargyri Oleati.
8. Unguentum Hydrargyri Oxidi Flavi (Golden Eye Ointment).
9. Unguentum Hydrargyri Oxidi Rubri (Red Precipitate Ointment).
10. Unguentum Hydrargyri Subchloridi.

*Give the Composition of Scott's Dressing.*

Camphor, olive oil, mercurial ointment, beeswax.

*What are the "Lead" Ointments?*

1. Unguentum Plumbi Iodidi.
2. Unguentum Plumbi Subacetatis.

## VINA.

*Describe Vinum Aurantii.*

A fermented saccharine solution to which fresh bitter orange peel has been added, and containing 12 to 14 per cent. alcohol.

*What Official Wines are obtained from it?*

1. Vinum Ferri Citratis, containing 1·8 per cent. iron and ammonium citrate. Dose 1 to 4 drams.
2. Vinum Quininæ, containing 1 grain quinine hydrochloride in each ounce. Dose ½ to 1 ounce.

*Describe Vinum Xericum.*

Sherry: containing not less than 16 per cent. by volume of ethylic alcohol.

*What Official Wines are prepared with it?*

1. Vinum Antimoniale, containing ·4 per cent. tartar emetic. Dose, as an expectorant, 10 to 30 minims; as an emetic, 2 to 4 drams.
2. Vinum Colchici, containing 20 per cent. colchicum corm. Dose 10 to 30 minims.
3. Vinum Ferri, quantity of iron variable. Dose 1 to 4 drams.
4. Vinum Ipecacuanhæ, standardised to contain ·1 per cent. alkaloids. Dose, as an expectorant, 10 to 30 minims; as an emetic, 4 to 6 drams.

## PRESCRIBING.

*What should always be avoided in prescribing?*

Incompatibility of the ingredients.

*How many Kinds of Incompatibility are there?*

Three:—

(*a*) *Chemical*: where interaction takes place and another salt is formed, either in solution or as a precipitate, *e.g.* carbonate of ammonium and syrup of squills, the acetic acid of the latter combining with the former and producing acetate of ammonium, which does not possess any expectorant qualities.

(*b*) *Physical*: when the mixture of the substances will not form a clear mixture; *e.g.* oils with water; or the addition of water to a resinous tincture. In such cases it is usual to add to the mixture some mucilage to suspend the insoluble substance.

(*c*) *Pharmacological*: the combination of drugs with opposed actions, *e.g.* chloral hydrate with strychnine.

*Give some further Examples of Chemical Incompatibility.*

1. Liquor arsenicalis with iron salts. In this case the arsenical solution, being alkaline, would precipitate oxide of iron.

2. Linimentum camphoræ ammoniatum with acetic acid, for a stimulating liniment. Here the stimulating effect would be lost, as acetate of ammonium would be formed.

3. Permanganate of potash and extract of gentian. Owing to the former being readily oxidisable, an explosive compound is formed.

4. Alkaloids or alkaloidal salts with alkaline salts in solution. In such a case the alkaloid will be precipitated.

*Mention a few Pharmacological Incompatibilities.*

1. Strychnine and bromide of potassium.
2. Digitalis and aconite.
3. Aloes with kino.
4. Atropine or belladonna and pilocarpine.

*What are the Essential Parts of a Prescription?*

1. *Superscription*—This is represented by the symbol "℞" which signifies "recipe," and is the second person singular, present imperative, active voice of the Latin verb, *Recipio*, I take. It is always followed by the accusative case.

2. *Inscription*—This forms the body of the prescription, and consists of the names and quantities of the drugs, the quantities being put in the accusative case after the verb, and the names of the drugs being put in the genitive case after the preposition "of" understood: *e.g.*

Recipe
Potassii Bromidi, drachmas duas.
Take thou
(of) Potassium Bromide, drams two.

3. *Subscription*—This consists of directions to the pharmacist as to the manner in which the prescriber wishes the prescription to be compounded, and, in the case of a mixture, usually consists of the words:—

Misce = Mix thou
Fiat mistura = Let a mixture be made.

4. *Signature*—This is composed of directions to the patient as to the manner in which the medicine is to be used, and is usually written in Latin.

Every prescription should also bear the initials or name of the prescriber, and have the date on it as well as the patient's name.

*How should the Inscription be constructed?*

It should consist of four parts, viz.

(*a*) The Basis, or principal active ingredient.
(*b*) The Adjuvans, to assist the action of the basis.
(*c*) The Corrigens, or Corrective, to render the mixture palatable, or to diminish unpleasant effects, *e.g.* griping, nausea, etc.
(*d*) Constituens, Vehicle or Excipient, to hold the drugs either in solution or suspension.

*Give an example of a Typical Prescription in full Latin.*

Recipe.
Potassii Acetatis, drachmas quatuor.
Spiritus Ætheris Nitrosi, drachmas sex.
Spiritus Chloroformi, drachmas duas.
Aquæ ad uncias sex.
Misce. Fiat mistura.
Capiat cochleare magnum ex unciâ unâ aquæ tertiis horis.

John Thomson, Esq. A. L. C.
1*st September* 1916.

(N.B. Abbreviated prescriptions are given under Pharmacology and Therapeutics).

## PHARMACOLOGY AND THERAPEUTICS.

### BLOOD PLASMA.

*How is the Plasma of the Blood affected by Drugs?*

Many drugs after absorption exist in solution in the plasma, and alter its composition by abstracting substances from it.

*What is the Reaction of the Plasma and how is it neutralised if too Acid?*

Normally, it is practically neutral, but in diseases, such as gout and diabetes, it is acid. It may be neutralised by the administration of citrates and tartrates, which become oxidised in the body to alkaline carbonates.

*Mention the Drug which is usually employed to reduce the Acidosis of Diabetic Coma.*

Sodium Bicarbonate, in doses of 150 to 500 grains per diem.

*Why are Alkalies given in Gout and which of them are usually given?*

To increase the solubility of the uric acid in the plasma, but their action in this respect is slight. Their chief action is in causing diuresis, whilst being excreted as carbonates, and aiding the excretion of uric acid by increasing its solubility in the urine.

The citrates of potassium and lithium are usually employed.

*In what other Ways can the Composition of the Plasma be altered?*

(*a*) By administering Purgatives, Diaphoretics, Diuretics.
(*b*) By Venesection or Transfusion.

## BLOOD CORPUSCLES.

*What are Hæmatinics?*

Drugs which increase the number of red corpuscles and the amount of hæmoglobin when it is deficient. They may have a direct action, *e.g.* iron and its salts; arsenious acid; or they may act indirectly, by removing some obvious cause for the deficiency of hæmoglobin, *e.g.* mercury in syphilis; quinine in ague.

*How does Potassium Chlorate affect the Red Corpuscles?*

It alters the composition of the hæmoglobin by converting it into methæmoglobin, thus preventing its uniting with oxygen. It does so only when taken in excess.

*Mention any other Drugs having a similar Action.*

Phenazone, phenacetin, phosphorus, and nitrites.

*Indicate any Drugs which affect the White Corpuscles.*

All irritants cause them to wander through the capillary walls.

The alkaloids of cinchona arrest their movements.

*Write a Prescription for a Hæmatinic.*

℞

| | |
|---|---|
| Ferri et Ammon. Cit., | ℥iss. |
| Liq. Fowleri, | ℥i. |
| Tinct. Nucis. Vom., | ℥ii. |
| Aq. Chlorof. ad, | ℥vi. misce. |

Fiat. mist.

Cpt. coch. mag. ter in die post cibos.

*What Effect on the Corpuscles has the Administration of a large Amount of Sodium Chloride?*

It will cause the red corpuscles to pass rapidly through the walls of the capillaries.

*When is it desirable to increase Coagulation of the Blood?*

In operations on jaundiced patients, in hæmoptysis, in aneurysm, in hæmophilia, and in chilblains.

*What Drugs are employed for this Purpose?*

The chloride or lactate of calcium. These salts often fail to produce the desired result, as very large doses would be necessary to have a therapeutic effect.

*Describe the Effect of Citrates on the Blood.*

They have been used to diminish coagulability in cases of thrombosis and embolism.

*How would you prescribe for a Case of Secondary Anæmia?*

℞

| | |
|---|---|
| Tinct. Ferri Perchlor., | ℥iiss. |
| Potass. Chloratis, | ʒi. |
| Glycerini, | ʒiv. |
| Aquæ Chlor. ad, | ℥vi. Misce. |

Ft. mist. Cpt. coch. mag. ex aq. ter in die p.c.

*When would this Prescription be contra-indicated?*

In anæmia due to hæmorrhage from gastric erosion.

## CARDIAC DRUGS.

*What are the Various Channels through which Drugs act on the Heart?*

1. Directly on the Cardiac Muscle.
2. On the Vagus Centre.
3. On the Accelerating Centre.
4. On the Cardiac Nerve Ganglia.
5. On the Blood-Vessels.

*How do Cardiac Stimulants act?*

1. By increasing the force of the cardiac contraction and slowing the pulse; *e.g.* digitalis, strophanthus, squill, etc.

2. By increasing the rate of the cardiac contraction; *e.g.* atropine, hyoscyamine, cocaine, caffeine, etc.

3. By increasing both the force and the rate of cardiac contraction; *e.g.* alcohol, ether, chloroform, quinine, etc.

*Write a Prescription for a Cardiac Stimulant.*

℞

| | |
|---|---|
| Tinct. Digitalis, | ʒiss. |
| Spts. Ether, | ʒiii. |
| Spts. Chloroformi, | ʒii. |
| Aq. ad., | ℥vi. Misce. |

Cpt. coch. mag. quater in die ex aq.

*What are Cardiac Depressants?*

Drugs which markedly decrease the force and rate of the cardiac contractions by acting directly on the heart; *e.g.* prussic acid, aconite, antimony, arsenic, bromides, phenazone, phenacetin, chloral hydrate, etc.

*How would you ascertain that a Drug influencing Cardiac Action did so through the Vagus Centre?*

If, by cutting the vagus nerve, or stimulating its peripheral end, the alteration of the cardiac action ceases, it follows that the vagus centre must have been influenced.

*Mention some Drugs which slow the Pulse by stimulating the Vagus Centre.*

Aconite, veratrine, digitalis, strophanthus, squill, strychnine, prussic acid, alcohol, ether, chloral hydrate, etc.

*How is the Vagus Centre chiefly excited or depressed?*

It is excited by increased blood pressure and venous blood, and depressed by diminishing the blood pressure with nitrites.

*Mention some Drugs which stimulate the Accelerating Centre.*

Ammonia, apomorphine.

*How is the Heart affected through the Cardiac Nerve Ganglia and which Drugs do so?*

Its rate is at first a little slowed, but soon becomes rapid, weak, and irregular.

Nicotine, conium, lobelia, gelsemium, act in this manner.

## DRUGS ACTING ON BLOOD-VESSELS.

*How may such Drugs act?*

Either locally on the vessels themselves or reflexly on the vaso-motor centres. Some when applied locally dilate the vessels, others contract them. Some by their action on the vaso-motor centres, dilate the vessels and reduce the blood-pressure, others do the direct opposite.

*Give a Classification of Local Vascular Dilators with Examples.*

(*a*) Rubefacients cause the skin to become red by vascular dilatation, *e.g.* capsicum, mustard.

(*b*) Vesicants in early stages are rubefacient, but later there is an escape of plasma and corpuscles, raising of the epidermis, and formation of vesicles, *e.g.* glacial acetic acid, cantharidin.

(*c*) Pustulants, after passing through the vesicant stage, cause emigration of leucocytes, which collect in the vesicles and form pus, *e.g.* croton oil.

(*d*) Caustics or Escharotics destroy the vitality of local tissue and set up vascular dilatation of the surrounding area, *e.g.* pure acids.

*How would you Classify Caustics?*

(*a*) Penetrating, cause great pain with sloughing, and penetrate the tissues in an unlimited manner by abstracting water from them, *e.g.* caustic potash, zinc chloride, sulphuric acid, etc.

(*b*) Congestive, coagulate superficial and inflame deep

tissues with limited effects, *e.g.* silver nitrate, copper sulphate, etc.

(*c*) Oxidising, yield oxygen, destroying all organisms and products of decomposition, *e.g.* chromic acid.

(*d*) Anæsthetic, produce irritation of superficial epithelium, followed by anæsthesia and localised gangrene, *e.g.* carbolic acid.

*What Drugs, administered internally, dilate Arterioles by acting locally on them?*

Belladonna, hyoscyamus, stramonium, and all nitrites.

*Mention some Drugs which dilate the Vessels by acting on Vaso-motor Centre.*

Alcohol, ether, chloroform, chloral, prussic acid, opium.

*Give a Classification of Hæmostatics or Styptics.*

1. Drugs which, when given internally, contract arterioles by acting locally on them, *e.g.* ergot, adrenalin, digitalis, squill, physostigmine.

2. Drugs which, when given internally, contract arterioles by acting on the vaso-motor centre, *e.g.* ergot, digitalis, squill, physostigmine, belladonna.

3. Drugs which, when applied externally, contract the muscular coat of the vessels, *e.g.* alum, dilute solutions of silver salts, lead salts.

4. Drugs which, when applied externally, coagulate albuminous fluids around the vessels, *e.g.* tannin, silver, lead, and copper salts.

5. Drugs which, when given internally, reduce the blood pressure by depressing the cardiac action, *e.g.* aconite, antimony.

*How would you stimulate a Sore or an Ulcer to heal?*

By the application of drugs which locally dilate the vessels so as to promote absorption of inflammatory products, and bacterial toxins.

*Give the Treatment of Angina Pectoris.*

By administering drugs which, by their central action, cause dilatation of all the vessels, thus rendering the work of the heart easier.

*Write a Prescription for a Case of Angina Pectoris.*

℞

| | |
|---|---|
| Sodii Iodidi, | ʒiss. |
| Spts. Ammon. Aromat., | ℥i. |
| Liq. Trinitrini, | ♏xvi. |
| Aq. Chloroformi ad, | ℥viii. Misce. |

Fiat mist. Cpt. ℥ss ter in die ex aq. p.c.

## DRUGS ACTING ON THE SKIN.

### DIAPHORETICS.

*In what Ways do Drugs increase Perspiration?*

1. By stimulating the sweat centres in the cord, the nerves proceeding from these centres to the sweat glands, the terminations of such nerves in the glands, or the glandular cells themselves.

2. By dilating the cutaneous vessels, so increasing the amount of blood, causing greater warmth and stimulating glandular activity.

*Mention some Diaphoretics.*

Pilocarpine, antimony salts, citrates and acetates of ammonium and potassium, ipecacuanha, opium, aconite.

*What is a Sudorific?*

It is a powerful diaphoretic, *e.g.* pilocarpine.

*What are the Indications for the Uses of Diaphoretics?*

1. When excretion of urine is failing, *e.g.* Bright's disease.

2. When it is necessary to eliminate poisons from the system, *e.g.* uræmia.

3. When it is necessary to increase the loss of heat by increased evaporation, *e.g.* in fevers.

*Write a Prescription for a Diaphoretic.*

℞

| | |
|---|---|
| Potassii Acetat., | ʒiv. |
| Spts. Ætheris Nit., | ʒvi. |
| Liq. Ammon. Acet., | ℥i. |
| Aquæ ad, | ℥vi. Misce. |

Fiat mist. Cpt. coch. mag. ex aq. tertiis horis.

## ANHIDROTICS.

*What are Anhidrotics and when are they used?*

Drugs which diminish the amount of perspiration. They are used (1) for general conditions, as phthisical sweats; (2) for local conditions, as sweating of the feet.

*Mention some such Drugs,*

Atropine, belladonna, hyoscyamus, zinc oxide.

*Write a Prescription for an Anhidrotic,*

℞

| | |
|---|---|
| Zinci Oxid., | grs. ii. |
| Ext. Belladonnæ Sicc., | gr. ¼. |
| Ext. Hyoscyami, | grs. ii. Misce. |

Ft. pil. Mitte duodecim tales.
Cpt. duas horā somni.

*Mention some Drugs which, when excreted by the Skin, cause irritation and produce a Rash.*

Copaiba, cubebs, bromides, iodides, arsenical salts, belladonna, chloral, aconite.

## URINARY SYSTEM.

*What are Diuretics, and how do they act?*

Drugs which increase the quantity of urine secreted, and which may be classified as follows:—

(*a*) Cardio-vascular, increase force and frequency of cardiac action, constrict peripheral vessels, and raise the blood pressure, *e.g.* digitalis, squill, alcohol, caffeine, strychnine.

(*b*) Loco-vascular, act locally on the kidney, dilating the renal vessels without influencing general blood-pressure, *e.g.* sweet spirit of nitre, juniper, volatile oils, etc.

(*c*) Renal, acting on the renal cells, increasing the amount of water and solids excreted, *e.g.* acetate, citrate, and nitrate of potassium, calomel, alcohol, salines.

*When are Diuretics indicated?*

1. In cardiac and pulmonary diseases when, owing to general vascular disturbance, the quantity of urine is diminished.
2. In ascites and pleuritic effusions to diminish excess of pathological fluid.
3. To dilute the urine when it is prone to deposit its solids.

*Write a Prescription for a Diuretic in a case of Ascites.*

℞

| | |
|---|---|
| Potass. Citratis, | ʒiv. |
| Spt. Ætheris, | ʒiii. |
| Tinct. Digitalis, | ʒii. |
| Inf. Buchu ad, | ℥vi. Misce. |

Ft. mist. Cpt. coch. mag. quartis horis.

*What Drugs render the Urine Acid and when are they indicated?*

Benzoate of ammonium, benzoic acid, acid sodium phos-

phate. They are required in pyelitis and cystitis when the urine is decomposed and has an alkaline reaction.

*Mention some Drugs which render the Urine Alkaline, and the Indications for their Use.*

Tartrates and citrates of potassium, sodium, and lithium. They are used in gouty subjects so as to render precipitation of uric acid unlikely, or to assist in dissolving uric acid calculus.

*How is Alkaline Decomposition of the Urine prevented in Cystitis?*

By administering benzoic acid, acid sodium phosphate, or hexamine. The latter drug acts when the urine is acid, so it is usual to combine it with acid sodium phosphate.

*Mention some Drugs which alter the Colour of the Urine.*

1. Turpentine and cantharidin set up renal inflammation and cause blood to appear in the urine.
2. Rhubarb and senna, owing to the chrysophanic acid present in them, render the urine, if acid, a brownish colour; if alkaline, a purplish red.
3. Santonin colours acid urine yellow, alkaline urine red.
4. Carbolic acid and other tar preparations make it dark green.
5. Methyl violet turns it a dark blue.
6. Logwood renders alkaline urine red or violet.

## ANTIPYRETICS.

*How do Antipyretics act?*

Drugs which reduce the temperature, when raised owing to disease, act either by increasing the loss of heat, or by diminishing its production.

*How is the Body-heat produced and lost?*

The greatest amount of heat is produced in the muscles,

and this production is presided over by a cerebral centre, probably the corpus striatum.

Heat is lost mostly by radiation from the vessels of the skin, and by evaporation of perspiration, both of which channels are under the control of the central nervous system. Heat is also lost through the respiratory system.

*Mention some Antipyretics which increase the Loss of Heat.*

Alcohol, nitrous ether, antimony, ipecacuanha, dilators of the cutaneous vessels, cold.

*What Drugs diminish Production of Heat?*

Phenacetin, phenazone, acetanilide; these act on cerebral centres. Quinine, salicylic acid, salicin; these directly diminish metabolism.

*In what Manner do Purgatives act as Antipyretics?*

By the removal of some intestinal irritant which acts reflexly.

*How does Hot Water reduce the Temperature?*

By dilating cutaneous vessels, and inducing subsequent sweating.

*What Precautions are necessary in using Acetanilide and Phenazone?*

These are cardiac depressants and may produce collapse. They should be administered with a cardiac stimulant, *e.g.* ammonia.

## RESPIRATORY DRUGS.

*How would you classify Inhalants?*

1. *Sedative*, *e.g.* hydrocyanic acid (rarely employed).
2. *Stimulant*, increase the vascularity, secretion, and

muscular power of the bronchi, *e.g.* phenol, creosote, friar's balsam, ol. cubebs, etc.

3. *Antiseptic*, *e.g.* creosote, iodoform, $SO_2$, oil of Juniper, phenol, etc.

4. *Antispasmodic*, *e.g.* conium, chloroform, ether, amyl nitrite.

*Write a Prescription for an Antiseptic Stimulating Inhalation.*

℞

| | |
|---|---|
| Menthol, | grs. v. |
| Acid. Carbolic, | grs. 10. |
| Creosoti, | ♏ x. |
| Spt. Chloroformi ad, | ℥i. Misce. |

Ft. Inhalatio, m.d.u.

*Give, with Examples, a Classification of Expectorants.*

1. *Antispasmodic.*—Acting either directly on the bronchial muscles, widening the bronchi, or on the terminations of the vagus in the bronchial muscles, paralysing them, *e.g.* stramonium, atropine, hyoscyamus, lobelia, chloroform, ether, etc.

2. *Emetic.*—Acting by exciting vomiting, thinning secretion, and mechanically dislodging the mucus, *e.g.* ipecacuanha and antimony, in large doses; squill; senega; etc.

3. *Secretory.*—Acting by stimulating the bronchial glands and increasing secretion, *e.g.* apomorphine, pilocarpine, camphor, etc.

4. *Antiseptic.*—Altering the composition of the mucus, and, at the same time, stimulating the bronchial muscles, *e.g.* balsams, volatile oils, etc.

5. *Depressant.*—Causing depresssion of respiratory centre and painless expulsion of mucus, *e.g.* apomorphine, lobelia, codeine, ether, etc.

6. *Excitant.*—Stimulating the respiratory centre, and imparting tone to the bronchial muscles, *e.g.* belladonna, stramonium, strychnine.

7. *Ciliary Excitants.*—Acting as sialagogues and assisting in the liquefaction of the sputum, *e.g.* alkalies.

*When should Excitant Expectorants be used?*

When there is any difficulty in respiration from the presence of mucus, so as to increase the force of the respiratory act.

*When is Morphia contra-indicated as an Expectorant, and why?*

When the bronchial tubes are filled with secretion, because it checks expectoration, renders the secretion tenacious, diminishes sensibility, allays the cough, and the secretion is thus allowed to gather in the tubes.

*What would you prescribe in the Early Stages of Acute Bronchitis?*

℞

| | |
|---|---|
| Vin. Antimon., | ʒiv. |
| Liq. Morph. Tart., | ʒiss. |
| Vin. Ipecac., | ʒii. |
| Aq. Camph. ad | ℥vi. Misce. |

Fiat mist. Cpt. coch. mag. tertia quaque hora.

## ALIMENTARY SYSTEM.

### MOUTH.

*Describe the Anatomical Structures concerned in the Act of Salivation.*

The submaxillary gland which is under the influence of the chorda tympani nerve. This nerve has its centre in the medulla, and is capable of being excited reflexly, by stimulation of the gastric branches of the vagus, and the terminations of the glosso-pharyngeal and gustatory nerves in the tongue and mouth. These nerves contain vaso-dilator fibres. The gland is also supplied with sympathetic fibres from the cervical sympathetic trunk, which contain vaso-constrictor fibres.

*What are Sialagogues, and how do they act?*

Drugs which increase the flow of saliva. They act by—

(*a*) Stimulating either the secretory cells or the nerve endings in those cells, *e.g.* pilocarpine, physostigmine, mercury, iodine compounds.

(*b*) Stimulating the peripheral ends of afferent nerves, *e.g.* ether, mustard, ginger, acids (these stimulate the gustatory and glosso-pharyngeal nerves in the mouth), emetics (these stimulate the gastric vagus).

*What are Antisialagogues?*

Drugs which diminish the secretion of saliva, *e.g.* belladonna, hyoscyamus, opium, alkalies.

*Describe Refrigerants.*

Drinks which relieve a febrile deficiency of saliva, accompanied by intense thirst, *e.g.* effervescing acid drinks.

## STOMACH.

*What are Stomachics?*

Drugs which increase the amount of gastric juice secreted, *e.g.* aromatics, condiments, alcohol, ether, chloroform, bitters.

*Mention the Different Varieties of Bitters.*

1. *Simple*, *e.g.* calumba, quassia, quinine, strychnine.
2. *Aromatic*, *e.g.* gentian, cascarilla, orange.
3. *Pungent*, *e.g.* mustard, horseradish, pepper, ginger.
4. *Sweet*, *e.g.* liquorice, glycerin.
5. *Sour*, *e.g.* all dilute mineral acids.
6. *Spirituous*, *e.g.* alcohol.

*Name the Substances which decrease the Secretion of Gastric Juice.*

Alkalies, fats, large doses of alcohol, ether, or chloroform.

*Write a Prescription for a "Bitter" Tonic.*

R

Acid. Nitro-hydroch. Dil., ʒii.
Liq. Strychnin. Hyd. ʒi.
Tinct. Aurantii, ʒiv.
Infus. Gent. Co., ad ℥vi. Misce.

Fiat. mist. Cpt. coch. mag. ter in die ante cibos ex aq.

*When should the Dilute Mineral Acids be given after meals?*

In cases in which the cause of indigestion is due to a deficiency in the amount of hydrochloric acid secreted, they are best administered, sometimes in combination with pepsin, about two hours after a meal.

*In what other Way do Stomachics act?*

By increasing the vascularity of the stomach. The gastric vessels are very sensitive, and not only do the dilated vessels favour the secretion of gastric juice, but they facilitate absorption.

*What are Gastric Sedatives?*

Drugs which allay pain, or arrest vomiting; they may act in a mechanical manner by forming a coating over sensitive areas of the stomach, *e.g.* bismuth salts; or they may act as anæsthetics to the nerve endings, *e.g.* opium, prussic acid, belladonna, etc.

*How would you prescribe for Dyspeptic Irritation?*

R

Bismuth. Carb., ʒiv.
Acid. Hydrocyan. Dil., ʒss.
Liq. Morph. Hyd., ʒiss.
Pulv. Acaciæ, ʒii.
Aq. Chlorof., ad ℥viii. Misce.

Fiat. mistura. Cpt. coch. mag. p.p.a. ter in die ante cibos.

*Why is Nux Vomica often prescribed in Gastric Cases?*

Because its active principle, strychnine, acts chiefly on the gastric muscles, stimulating them to increased peristalsis, and so assisting digestion by a proper "churning" of the gastric contents.

*How do Carminatives affect the Stomach?*

They stimulate the muscular and circulatory activity, and, by relaxing the cardiac orifice, bring about eructation and relief of distension.

They also act as diffusible stimulants by reflexly stimulating the sympathetic ganglia, and having slight local anæsthetic properties, they act as antispasmodics. They are represented by alcohol, ether, volatile oils, valerian, etc.

*Classify Emetics.*

1. *Gastric.*—Acting directly on the stomach, *e.g.* mustard, salt, alum, squill, ipecacuanha, antimony, zinc sulphate, etc.
2. *Central.*—Influencing the medullary centre, *e.g.* apomorphine, antimony, etc.
3. *Mixed.*—Acting on both stomach and medullary centre, *e.g.* apomorphine (slightly), antimony, ipecacuanha.

*Mention the Uses of Emetics.*

1. To remove the contents of the stomach.
2. To expel the contents of the air passages, and thus assist expectoration.
3. To remove foreign bodies from the œsophagus.

*What should be noted in selecting an Emetic?*

The condition of the patient. If in a state of collapse, do not give apomorphine, antimony, or ipecacuanha, as these are very depressing, but wash out the stomach.

*When are Emetics contra-indicated?*

In aneurysm, hernia, rectal or uterine prolapse, peritonitis, or a tendency to hæmorrhage.

*What are Antiemetics?*

They are gastric sedatives (*q.v*).

## LIVER.

*Name the Functions of the Liver.*

1. To secrete bile.
2. To form and store up glycogen.
3. To form urea.
4. To destroy pathogenic organisms.

*What is the Chief Function of the Bile?*

To stimulate the peristaltic movements of the intestines.

*Define Cholagogues and give their Action.*

They are drugs which influence the secretion of the bile, but their mode of action is rather obscure; for it does not follow that, because more bile is excreted in the fæces, more has been secreted by the liver. The excess of excreted bile may be due to a thorough clearance of the gall-bladder and ducts, or, it may be, that the bile, which has been poured into the duodenum, has been hurried along the intestine before re-absorption has had time to take place.

*How then would you classify Cholagogues?*

1. Direct cholagogues which act on the liver cells.
2. Indirect cholagogues, which influence the amount of bile excreted, but do not influence the secretion by the liver.

*Are there any True Direct Cholagogues? Name some so reputed.*

There is only one, viz., fel bovinum purificatum; this, when given by the mouth, is absorbed, carried to the liver,

stimulates the activity of the hepatic cells, and increases the secretion of the bile. Euonymin, sodium salicylate, and podophyllum are believed to be direct in their action.

*Mention some Indirect Cholagogues.*

Many of these have no claim to be called cholagogues, as they really act by emptying the bowel. They are calomel, sodium sulphate, sodium phosphate, aloes, colocynth, colchicum, rhubarb, jalap, scammony, etc.

*What Drugs influence the Formation of Urea?*

Phosphorus, antimony, arsenic, ammonium chloride, iron; these all increase the quantity of urea excreted by the urine. Opium, colchicum, quinine, alcohol, decrease the amount of urea excreted.

*Mention some Depressants of the Glycogenic Function.*

Phosphorus, antimony, arsenic; these not only arrest the formation of glycogen, but cause fatty degeneration of the liver. In certain forms of diabetes, opium, morphine, and codeine, diminish the quantity of sugar excreted in the urine.

*Write a Prescription for a "Liver" Pill.*

℞

| | | |
|---|---|---|
| Aloin, | gr. iss. | |
| Res. Podophylli, | gr. ss. | |
| Ext. Nucis Vom., | gr. ss. | |
| Ext. Hyoscyami, | grs. ii. | Misce. |

Fiat pilula. Mitte tales xxiv.

Sig. Sumat unam omni die ante prandium.

## INTESTINES.

*What Different Groups of Purgatives are recognised?*

1. *Laxatives.*—Slightly increase the action of the bowels, chiefly by stimulating their muscular coat, *e.g.* sulphur, magnesia, olive oil, figs, prunes, etc.

2. *Simple.*—Act more powerfully than the preceding, stimulating peristalsis, and increasing secretion, *e.g.* castor oil, cascara sagrada, senna, etc.

3. *Cathartics.*—Stimulate the intestinal glands, increase peristalsis and secretion. This group is subdivided as follows:—

(*a*) *Hydragogue Cathartics.*—Cause watery evacuations by excessive glandular stimulation, irregular peristalsis with some griping, *e.g.* jalap, scammony, colocynth, etc.

(*b*) *Saline Cathartics.*—These chiefly disturb osmosis; if in a concentrated form, they increase the passage of fluid from the tissues into the bowel, if in diluted solutions, they prevent absorption of fluid from the bowel; in either case, a large amount of fluid collects in the intestine, exciting gentle peristalsis and an easy and painless evacuation, *e.g.* sulphates of potassium, sodium, and magnesium; tartrated sodium, sodium phosphate, etc.

(*c*) *Drastic Cathartics.*—Cause severe irritation with abundant secretion of mucus, great vascular dilatation, sometimes hæmorrhage, severe abdominal pains, profuse diarrhœa, and often collapse, *e.g.* croton oil, large doses of colocynth.

(*d*) *Cholagogue Cathartics.*—(*Vide* LIVER).

4. *Enemata.*—Any fluid preparation injected into the rectum.

*What are "Synergists"?*

Adjuvants or medicines which assist the action of others.

*What Class of Purgatives specially require an Adjuvant?*

Saline cathartics; because we must increase peristalsis to prevent the excessively fluid contents of the intestines from being absorbed.

*In what Ways do Adjuvants assist Purgatives?*

1. By giving tone to the muscle of intestinal wall, *e.g.* nux vomica.

2. By causing more equal peristalsis and diminishing spasm, *e.g.* volatile oils, belladonna, etc.

*Give another Classification of Purgatives.*

1. Those that require bile for their action, *e.g.* scammony, jalap.

2. Those that can act without the presence of bile, *e.g.* castor oil, etc.

*Write a Prescription for a Simple Purgative.*

R

Ext. Cascar. Sag. Liq., ℥i.
Ext. Glycyrrhiz. Liq., ʒiv.
Tinct. Nucis Vom.,
Tinct. Belladonnæ, āā ʒv.
Glycerini,
Aquæ, āā partes æquales ad, ℥vi. Misce.
Fiat mistura.

Capiat coch. min. ex aq. ter in die p.c.

*Describe the Mode of Action of Intestinal Astringents.*

1. Directly on the muscular coats of the vessels of the intestines, causing them to contract, thus retarding exudation, *e.g.* lead salts, alum, dilute sulphuric acid, etc.

2. By precipitating and coagulating albuminous fluids, thus lessening the amount of excretion and constricting the vessels, *e.g.* tannin, krameria, kino, catechu, etc.

3. By diminishing the amount of intestinal fluid secreted, *e.g.* opium, calcium salts.

4. By diminishing the contractions of the muscular coat of the intestine, *e g.* opium, belladonna, hyoscyamus, etc.

*When is a Purgative advisable to stop Diarrhœa?*

When the cause of the diarrhœa is some irritating,

indigestible food, a mild purge such as castor oil or rhubarb is sufficient.

*What would you prescribe in a Case of Chronic Diarrhœa?*

℞

Acid. Tannic., grs. v.
Bismuth. Carb., grs. x.
Pulv. Cret. Aromat., c Opio, grs. x. Misce.
Fiat pulv. Mitte tales xii.
Capiat unum. ter in die.

*Define Intestinal Antiseptics.*

They are drugs which arrest putrefaction in the intestines, either by preventing the growth of, or completely destroying the micro-organisms on which decomposition depends. Unfortunately an intestinal antiseptic, in the true sense of the word, is as yet unknown, as drugs possessing antiseptic properties, when administered by the mouth, are completely altered in chemical composition by the gastric juice, so that their antiseptic action in the lower bowel is doubtful.

*What Drug is chiefly used as an Intestinal Antiseptic?*

Calomel,—this acts by stimulating the intestinal glands, promoting peristalsis, and hastening on the contents of the bowel. It is best administered in very small doses, at frequent intervals.

*Mention some Reputed Intestinal Antiseptics.*

Salol, naphthol, thymol, phenol, charcoal, camphor, creosote, turpentine, menthol, aromatic oils, bismuth salicylate, etc.

*Why is the Antiseptic Action of these Drugs on the Intestines considered doubtful?*

They would have to be administered in toxic doses, since a great quantity of the drug, should it pass unaltered through the stomach, would be absorbed in the duodenum, and in

order to prevent complete absorption, a dose with a toxic effect would be necessary to enable the antiseptic effect to be exercised in the lower bowel.

*What are Antiperiodics, and how do they act? Give some Examples.*

Drugs which arrest the return of diseases which recur periodically. They act as direct poisons to the pathological micro-organisms.

Cinchona bark, quinine, arsenic, eucalyptus, hydrastis, salicylic acid, salicin, etc.

*Describe Anthelmintics.*

Drugs which expel or kill worms which infest the intestines.

*Name the Different Classes recognised, with Examples.*

1. Vermifuges, which simply expel the parasites, *e.g.* santonin, cathartic purgatives.

2. Vermicides, which kill them, *e.g.* thymol, male fern, turpentine, cusso, pelletierine, embelia, melon pumpkin seeds.

*Write a Prescription containing Male Fern for Tapeworm.*

℞

| | |
|---|---|
| Ext. Filicis Liq., | ℥ 75. |
| Ovi Vitelli, | i. |
| Aquæ Chloroformi et | |
| Syr. Simp. q.s. ad, | ℥ii. Misce. |

Fiat haustus, mane sumendus.

*Give the Treatment for Thread Worms.*

These parasites infest the lower bowel, and are best reached by enemata of common salt (1 ounce to a pint). The injections should be repeated every second night, until the worms and their ova disappear from the fæces. Santonin, by the mouth, is not to be relied on, as the drug is absorbed before reaching the rectum, but it may

be administered as a suppository. Other enemata are often employed, *e.g.* quassia, aloes, turpentine, etc.

*How would you treat Anchylostomiasis?*

Thymol is the specific drug for this parasite, but it has to be given in huge doses. The patient should fast for eight or ten hours, then a smart purgative is administered. A few hours later 30 grains of thymol, in a cachet, are given, and this dose is repeated twice, at intervals of two hours (sometimes one dose of 60 grains is given). To prevent absorption of the drug, no oily or fatty purgative should be administered afterwards, but 5 grains of calomel should be given six or eight hours after the last dose of thymol. Subsequently the anæmia, which is always present, should be treated with iron and arsenic.

## GENERATIVE ORGANS.

*What Classes of Drugs act on the Uterus?*

1. Ecbolics or Oxytocics—drugs which increase uterine action, during or immediately after parturition, *e.g.* ergot, quinine, hydrastis, suprarenal extract, pituitary extract, etc.

2. Emmenagogues—drugs which increase the menstrual flow. These may be subdivided into (*a*) those acting directly on the uterus, *e.g.* ecbolics, asafetida, myrrh, borax, etc., (*b*) those which so improve the constitution that menstruation becomes normal, *e.g.* iron, purgatives, cod liver oil, strychnine, etc.

3. Uterine depressants—drugs which restrain uterine contractions, *e.g.* bromides, opium, chloral, chloroform, Indian hemp, etc.

*What are Galactagogues?*

Drugs which increase the secretion of milk, *e.g.* pituitary extract, pilocarpin.

*Mention a Drug with an Opposite Action.*

Belladonna.

## NERVOUS SYSTEM.

*How do Counter-irritants relieve Pain?*

Although the application of such drugs to the skin causes pain by stimulation of the terminations of the sensory nerves, it must be borne in mind that pain is always referred to the periphery and appreciated centrally, hence peripheral stimulation of the sensory terminals, which also reflexly excites the heart and respiration, will assist in restoring a normal condition in deep-seated structures.

*Differentiate between Anodynes, Analgesics, and Local Anæsthetics.*

Anodynes relieve pain by depressing the terminations of sensory nerves.

Analgesics relieve pain by depressing the excitability of nerve centres.

Local Anæsthetics, as well as relieving pain, abolish local sensibility.

*Mention some such Drugs.*

Anodynes — aconite, belladonna, opium, dilute prussic acid, etc.

Analgesics—antifebrin, phenacetin, phenazone, etc.

Local Anæsthetics—cocaine, benzamine, phenol, etc.

*Why does Warmth relieve Pain?*

Because it dilates the vessels and relieves tension.

*How is Peripheral Neuritis produced?*

Some drugs when taken habitually produce chronic inflammation of the nerve trunks, which is evidenced by a great increase of the fibrous tissue between the nerve fibres, and fatty degeneration of the fibres themselves. In the early stages much pain and tingling is prevalent, owing to the nerve irritation, but later there is loss of function, anæsthesia and paralysis.

*Mention some Drugs producing this Condition.*

Lead, alcohol, arsenic, mercury, etc.

*What would you prescribe in a Case of Lead Poisoning?*

Give full doses of potassium iodide, so as to form a soluble lead compound, which enters the tissues and circulation and is mainly eliminated by the intestinal mucous membrane. At the same time magnesium sulphate should be combined with the iodide of potassium, so that the insoluble sulphate of lead may be formed in the bowel, and speedily swept away by the purgative action of the saline.

*Mention some Drugs which act on the Spinal Cord.*

1. Strychnine, ammonia, brucine, thebaine; these all increase the irritability of the anterior cornua.
2. Physostigmine, bromides, alcohol, chloroform, ether, opium, etc.; these all depress the activity of the anterior cornua.
3. Ergot may produce sclerosis of the posterior columns.
4. Lead may cause atrophy of the anterior cornual cells.
5. Alcoholic abuse causes degeneration of the entire cord.

*What General Laws are illustrated by Drugs acting on the Brain?*

1. When a drug affects functions progressively, those first affected are the last acquired by the individual, and the last to appear in the species; those last affected are the first acquired by the individual.
2. When a drug in moderate doses excites a function, in large doses it often paralyses it.

*Give Examples of these.*

The first law, known as the law of dissolution, is well exemplified in the case of an habitual alcoholic drinker. The first functions to become disordered are those of the intellect, viz. judgment and reason; the last functions to be

affected are respiration and circulation. The second law is exemplified in the administration of chloroform anæsthesia. Shortly after administration, the individual tosses about the arms and legs in a disorderly manner, but later on the limbs become motionless.

*Why are Bromides used in Epilepsy?*

Because they not only depress the motor area of the cord, but they also diminish the activity of the cerebral motor area.

*What Drugs excite the Motor Area of the Cerebral Cortex?*

Atropine, strychnine, physostigmine; but they are never employed therapeutically for this purpose.

*Mention some Drugs which act as General Cerebral Stimulants.*

Belladonna, stramonium, hyoscyamus, Indian hemp, opium, cocaine, caffeine, alcohol, ether, chloroform, etc.

*Is the Stimulating Effect of these Drugs maintained?*

No; although many of them are taken habitually as cerebral stimulants, in the majority of instances the stimulant effect gives way to a paralysing influence.

*Give a Classification of General Cerebral Depressants.*

1. Hypnotics or soporifics; drugs which, by lessening the excitability and functional activity of the brain cells, produce an almost natural sleep, *e.g.* opium, morphine, chloral hydrate, bromides, sulphonal, paraldehyde, barbitone, Indian hemp, etc.

2. Narcotics; drugs which not only produce sleep, but also, in large doses, depress the functions of respiration and circulation, *e.g.* general anæsthetics, and large doses of hypnotics.

3. General anæsthetics; drugs which lead, not only, to a total loss of consciousness, but an abolishment of all reflex actions, *e.g.* ether, chloroform, alcohol, nitrous oxide, etc.

*Write a Prescription for a Sleeping Draught.*

℞

| | |
|---|---|
| Chloral Hydratis, | grs. 30. |
| Potassii Bromid., | grs. 30. |
| Liq. Morph. Hyd., | ♏ 30. |
| Syr. Aurant. Flor., | ℥iv. |
| Aquæ, | ad ℥iii. Misce. |

Fiat haustus. Sumat dimidium hora somni, et residuum hora tres postea, si opus sit.

*Describe the Various stages in General Anæsthesia?*

*First Stage.*—Excited imagination, incoherent speech, irregular exaltation.

*Second Stage.*—Irregular stimulation of cortical motor centres, resulting in wild gesticulations of arms and legs, this is accompanied by dulness of hearing and touch.

*Third Stage.*—Stimulation of heart and respiration, rise in blood-pressure, and flushed face.

*Fourth Stage.*—Depression of all functions previously excited, total abolition of all reflexes, complete loss of consciousness, contracted pupils, slowing of pulse and respiration.

*What are the Dangers of General Anæsthesia?*

1. Death from shock; this usually takes place before the patient is fully under the anæsthetic, reflex action is not quite abolished, and the peripheral stimulus of the operation reflexly stops the heart.

2. Death from respiratory paralysis; this may be due to a variety of causes, (*a*) excessive anæsthetic, (*b*) pulmonary disease, (*c*) lateral position of patient, required for operation. In any of these instances it is always heralded by lividity, and then the anæsthetic should be stopped and artificial respiration proceeded with.

3. Cardiac failure; due to a concentrated anæsthetic producing a sudden effect on the vagal centre. The patient becomes suddenly pale and the pulse stops. The remedy is to stop anæsthetic, give an inhalation of amyl nitrite, and begin artificial respiration.

4. Suffocation; due to retention of vomited matter in pharynx.

5. Reduction of body temperature; due to diminished activity and vaso-dilatation of the skin vessels. This danger may be easily minimised by keeping the surroundings of the patient as warm as possible during the operation and afterwards.

## EYE.

*What are Mydriatics, and how do they act?*

They are drugs which cause dilatation of the pupil, and they act—

(1) By paralysing the terminations of the third nerve, *e.g* atropine, homatropine, hyoscyamine, hydrocyanic acid, amyl nitrite, etc.

(2) By stimulating the terminations of the sympathetic, *e.g.* cocaine.

*How do Myotics act?*

Myotics cause contraction of the pupil by (1) stimulating the terminations of the third nerve, (2) stimulating the muscular fibres of the iris.

*Mention some Myotics.*

Pilocarpine stimulates the terminations of the third nerve.
Physostigmine stimulates the muscle.

*When is it necessary to dilate or contract the Pupil?*

Mydriatics are employed for ophthalmoscopic examination, and to prevent or break down iritic adhesions.

Myotics are employed to prevent too much light entering the eye in painful optic diseases, and to overcome mydriatic effects.

*What is the Effect of Drugs acting on the Ciliary Muscle?*

Accommodation may be impaired or paralysed.
Intra-ocular tension may be increased or decreased.

*Mention some Drugs acting in this Method.*

Atropine, hyoscyamine, homatropine, cocaine, physostigmine, pilocarpine; these interfere with accommodation.

Atropine (large doses), hyoscyamine; these increase intra-ocular tension. Cocaine, physostigmine, hyoscine decrease intra-ocular tension.

*What Drugs affect Colour Vision?*

Strychnine increases the capacity for seeing blue.
Santonine causes first violet, then yellow vision.

## ANTISEPTICS.

*What is an Antiseptic?*

It is a drug which arrests putrefaction either by preventing the growth of, or completely destroying, the micro-organisms on which the process of decomposition depends.

*Define a Disinfectant.*

It is a drug, the power of which is limited to the destruction of micro-organisms, causing decomposition.

*On what does the Power of Antiseptics depend?*

1. The temperature at which they act.
2. The medium in which they are dissolved.
3. The strength of the solution.
4. The time given them to act.
5. The number of micro-organisms present.

*How is Heat utilised as an Antiseptic?*

1. The dry method—by subjecting various articles to a temperature of 150°C in a dry air chamber.
2. The moist method—by driving steam, under pressure, through various articles, or by boiling them, *e.g.* surgical instruments, in water.

*Mention some other Antiseptics.*

Perchloride of mercury, chlorine, iodoform, carbolic acid, creosote, sulphur dioxide, peroxide of hydrogen, naphthol, cresol, boric acid, benzoin, etc.

*What are the Objections to Chlorine as an Antiseptic?*

It is too irritating, and has powerful bleaching properties.

*To what does Iodoform owe its Antiseptic Properties?*

It yields iodine when in contact with animal tissues.

*What Advantage has Carbolic Acid over Creosote?*

It is much more soluble in water.

*What are Antizymotics?*

Drugs which arrest fermentation.

*Mention some Antiparasitics.*

Mercurial preparations, chrysarobin, sulphur, storax, balsam of peru, stavesacre, formalin, sulphurous acid, etc.

*What are "Eupad" and "Eusol"?*

"Eupad" consists of equal weight of finely-powdered bleaching powder and boric acid. By adding $6\frac{1}{4}$ drams of this powder to $1\frac{3}{4}$ pints of water, "Eusol" is formed. The name "Eupad" is coined from *E*dinburgh *U*niversity *Pa*thological *D*epartment.

# PRESCRIPTIONS.

*How would you prescribe for Ulcerative Stomatitis?*

℞

| | |
|---|---|
| Potassii Chlorat., | ℥ iss. |
| Tinct. Ferri Perch., | ℥ iiss. |
| Glycerini, | ℥ iss. |
| Aquæ ad, | ℥ viii. Misce. |

Capiat coch. mag. quater in die.

*Describe the Action of this Mixture.*

The chlorate of potassium is excreted by the saliva being easily decomposed by septic tissues, and the nascent oxygen given off acts as a stimulant and antiseptic. The tincture of iron intensifies its curative action. Glycerin acts both as a corrective, and solvent for the potassium chlorate.

*Give a Prescription for a Chlorine Gargle and its Method of Preparation.*

℞

| | |
|---|---|
| Potassii Chlorat., | grs. x. |
| Acid. Hydroch., | ♏ 30. |
| Aquæ ad, | ℥ xii. Misce. |

Fiat gargarisma. Saepe utendum.

The drugs are mixed, then the water added gradually with constant agitation.

*For what other Purpose may this Gargle be employed?*

For mercurial ptyalism, as a mouth wash, or given internally.

*Why should not Anti-sialagogues be used in such a Case?*

Because the excessive salivation is an effort on the part of nature to eliminate the poison from the system.

*How would you prescribe for Hæmatemesis?*

℞

| | |
|---|---|
| Plumbi Acet., | grs. 40. |
| Acid. Acet. Dil., | ℥ i. |
| Liq. Morph. Acet., | ℥ ii. |
| Aq. Chlorof. ad, | ℥ vi. Misce. |

Cpt. ℥ ss. secundis horis ex paul. aq. si opus sit.

*What is the Action of the Lead Salt in such a Case?*

By combining with the albumin of the blood it forms compounds which, for the most part, are insoluble in water and acids. It also allays the pain and exerts a favourable influence over the course and progress of gastric ulcer.

*Why is Diluted Acetic Acid added to this Prescription?*

Because alkaloids are precipitated by alkaline solutions, and the acid ensures acidity of the mixture.

*Write a Prescription for Atonic Dyspepsia.*

℞

| | |
|---|---|
| Acid. Nitro-hydrochlor. Dil., | ℥ iii. |
| Liq. Strych. Hyd., | ℥ iss. |
| Tinct. Aurant., | ℥ iii. |
| Inf. Gent. Co. ad, | ℥ viii. Misce. |

Capiat coch. mag. ex paul. aq. ante cibos.

*Why is this administered before Meals?*

Because, in consequence of faulty digestion, acetic, lactic, and butyric acids are produced in the stomach from the starchy, saccharine, and fatty food constituents, and the administration of an acid after meals would add to the distress of the patient.

*What should be prescribed for Nausea and Vomiting due to an Irritable State of the Gastric Nerves?*

℞

| | |
|---|---|
| Acidi Carbolici, | grs. iv. |
| Bismuth. Subnit., | ℥ ii. |
| Muc. Acaciæ, | ℥ i. |
| Aq. Menth. Pip. ad, | ℥ iv. Misce. |

Cpt. coch. mag. tertiis horis.

*Write a Prescription for an Alkaline Gastric Mixture.*

℞

| | |
|---|---|
| Bismuth. Carb., | ℥ ii. |
| Sodii Bicarb., | ℥ iii. |
| Magnes. Carb., | ℥ iss. |
| Syrupi Zingiberis, | ℥ i. |
| Aq. Menth Pip. ad | ℥ viii. Misce. |

Sig. ℥ss ter in die post cibos p.p.a.

*Describe the Action of this Mixture and state why it should not be given before Food.*

When given an hour or so after meals, it neutralises the excessive acidity of the stomach. If administered before meals it would increase the amount of gastric juice secreted and so aggravate the acidity.

*When is the Administration of Bismuth Salts contra-indicated in Gastric Cases?*

In gastralgia due to habitual constipation, and in gastric affections due to chlorosis and hypochondria.

*Give a Prescription for Acute Pleuritis.*

℞

| | |
|---|---|
| Tinct. Aconiti, | ℥ ss. |
| Tinct. Opii, | ℥ iss. |
| Aq. Chlorof. ad, | ℥ ii. Misce. |

Cpt. ℥ i ex aq. quaque hora.

*State the Actions of these Druys in such a Case.*

The aconite slows the respiratory movements, thus reducing the amount of work done by the lungs; it also acts as a diaphoretic. Opium relieves the pain, and subdues the restlessness.

*What is the most Suitable Method to administer Opium as a Diaphoretic?*

Ten grains of Dover's Powder.

*Write a Prescription for Acute Bronchitis.*

℞

| | |
|---|---|
| Antim. Tart., | gr i. |
| Liq. Morph. Tart., | ℥ ii. |
| Vin. Ipecac., | ℥ ii. |
| Aq. Camph. ad, | ℥ vi. Misce. |

Cpt. coch. mag. tertia quaque hora.

*When is this Prescription indicated?*

In the very early stages when the bronchial tubes are dry, swollen, and congested. The Tartar Emetic causes the tubes to become moist, and the morphia allays the pain and irritation of the "useless" cough.

*How would you carry out this Treatment with Children?*

Avoid Morphia and give as follows:—

℞

| | |
|---|---|
| Vin. Antim., | ℥ i. |
| Vin. Ipecac., | ℥ ii. |
| Liq. Ammon. Acet., | ℥ iv. |
| Syr. Tolu., | ℥ iv. |
| Aq. ad, | ℥ ii. Misce. |

Cpt. ℥ i. secund. quaque hora.

*Write a Prescription for Acute Bronchitis, complicated with Cardiac Valvular Disease.*

℞

| | |
|---|---|
| Tinct. Digitalis, | ʒ ii. |
| Spt. Ammon. Arom., | ʒ vi. |
| Spt. Ætheris, | ʒ iv. |
| Spt. Chlorof., | ʒ iv. |
| Aquæ ad, | ℥ vi. Misce. |

Cpt. coch. mag. ex. min. cyath. aq. tertia quaque hora.

*Prescribe for the Later Stages of Bronchitis.*

When the expectoration becomes "loose" and more copious,—

℞

| | |
|---|---|
| Vin. Ipecac., | ʒ iv. |
| Tinct. Scillæ, | ʒ iv. |
| Spt. Ammon. Arom., | ʒ vi. |
| Syr. Tolu. ad | ℥ iii. Misce. |

Cpt. ʒ i. quater in die ex. aq.

*Write an Alternative Prescription for such a Case.*

℞

| | |
|---|---|
| Potass. Iodidi, | ʒ iss. |
| Vin. Ipecac., | ʒ iv. |
| Spt. Chlorof., | ʒ iv. |
| Inf. Senegæ ad, | ℥ vi. Misce. |

Cpt. coch. mag. quarta quaque hora ex. aq.

*When should the Administration of Opium or Morphine be avoided in Bronchitis?*

When the expectoration is loose and copious, as either of these drugs will check the sputum, rendering it more tenacious, and, at the same time, by diminution of bronchial sensibility, the cough vanishes and the secretion accumulates in the tubes.

*Give a Prescription for Chronic Dry Bronchial Catarrh.*

℞

| | |
|---|---|
| Potassii Iodid., | ʒ i. |
| Potassii Bicarb., | ʒ iv. |
| Ammon. Chlorid., | ʒ ii. |
| Ext. Glycyrrh. Liq., | ʒ ii. |
| Aq. Chlorof., ad, | ℥ viii. Misce. |

Cpt. coch. mag. quater in die ex aq.

*What is the Effect produced by these Alkaline Salts?*

They lessen the tenacious quality of the sputum, and render it more liquid.

*Write a Prescription to be administered during the Intervals between Attacks of Asthma.*

℞

| | |
|---|---|
| Sodii Iodidi, | ʒ iii. |
| Liq. Arsenicalis, | ʒ iss. |
| Vin. Ipecac., | ʒ vi. |
| Tinct. Belladonnæ, | ʒ ii. |
| Aq. Chlorof., ad, | ℥ viii. Misce. |

Cpt. coch. mag. bis in die ex aq. p.c.

*Indicate any Disadvantages of this Prescription.*

1. In a case of idiosyncrasy, where the patient is very susceptible to iodides, symptoms of iodism would be evident after the first dose.

2. It has to be persevered with for a lengthy period, and consequently is likely to produce iodism.

*How may Iodism be prevented?*

1. By large doses of sodium bicarbonate, which will keep the fluids of the body alkaline and thus prevent the liberation of free iodine.

2. Atropine, by arresting the morbid action taking place on the mucous surface, where the free iodine is recombining,

also prevents iodism (*N.B.* — Belladonna in foregoing prescription).

3. Large draughts of water taken during a course of iodides hasten elimination of the salt by diluting its solution.

*Prescribe a Mixture containing Æther, Ammonia, and Quinine, for a Case of Pneumonia with Cardiac Collapse.*

℞

| | |
|---|---|
| Spt. Ammon. Aromat., | ℥ iss. |
| Spt. Æther., | ʒ vi. |
| Tinct. Digitalis, | ʒ iii. |
| Spt. Chlorof., | ʒ iv. |
| Tinct. Cinchonæ, ad, | ℥ vi. Misce. |

Cpt. coch. mag. ex. cyath. vin. aq. quarta quaque hora.

*What is "Baly's" Pill?*

It is a pill composed of equal parts of (usually one grain of each), powdered digitalis, powdered squill, and blue pill, and is given in cases of cardiac dropsy. It is also known as "Guy's" Pill.

*Explain how Digitalis benefits Dropsy.*

By causing increased contraction of the small arteries and capillaries, it raises the blood pressure, and so affects the lymphatic and venous circulations. Its action as a diuretic must not be overlooked.

*Can Squill be employed in all Cases of Dropsy?*

In dropsy caused by any of the chronic diseases of the kidney, squill should not be used, as it is liable to produce great renal irritation. The same applies to the use of mercury, which acts on the renal epithelium, and raises the blood pressure in the renal system.

*When is Digitalis indicated in Heart Disease?*

When the action of the heart is rapid and weak, and the arterial tension low.

*Prescribe for a Case of Anæmia due to a Cardiac Lesion.*

℞
Tinct. Digitalis.
Tinct. Ferr. Perchlor., āā, ʒ iv.
Acid. Phos. Dil., ʒ iii.
Aquæ Chlorof. ad, ℥ viii. Misce.
Cpt. coch. med. ex. aq. ter in die p.c.

*Why should Digitalis be avoided in the Treatment of Angina Pectoris?*

Because it exerts a constringent action on the small blood-vessels, and thus raises the general blood pressure.

*Could it not be combined with a Vaso-dilator?*

No; the action of the latter is rapid and evanescent, whilst the digitalis is slow and continuous in its effect.

*Prescribe a Cardiac Tonic to be taken in the Intervals between Anginal Attacks.*

℞
Tinct. Strophanthi, ʒ iss.
Tinct. Nucis Vom., ʒ ii.
Liquor. Trinitrini, ♏ xvi.
Aq. Camphoræ, ad, ℥ viii. Misce.
Cpt. coch. mag. quater in die ex aq.

*How would you prescribe Acetate of Iron (which is not official), and when is its Use indicated?*

℞
Liq. Ferri Perchlor., ʒ iii.
Liq. Ammon. Acet., ℥ i.
Spt. Chloroformi, ʒ iii.
Aq. ad, ℥ viii. Misce.
Cpt. coch. mag. ter in die p.c.
It is indicated in the anæmia of Bright's disease.

*Suggest a Treatment for the Anæmia of Chronic Heart Disease.*

By administering iron, digitalis, and a purgative.

*Write a Prescription for such a Mixture in Pill Form.*

℞
Ferr. Redact., grs. ii.
Pulv. Digitalis, gr. i.
Ext. Aloes, grs. ii. Misce.
Fiat pilula. Mitte. xxiv. tales.
Capiat unam ter in die p.c.

*What are the Advantages and Disadvantages of Reduced Iron for Internal Administration?*

It is comparatively tasteless, and readily soluble in gastric juice.

Owing to oxidation of iron, however, the evolution of hydrogen gas, and the combination of this nascent gas with sulphur or phosphorus, unpleasant eructations occur.

*Mention some Instances in which the Official Doses of Drugs may be exceeded.*

1. In cases of unmistakable tertiary syphilis, potassium iodide may be administered in doses of 30 grains thrice daily.

2. In chlorosis and anæmia the official dose of some of the iron preparations may be greatly exceeded, but it is always wise to begin treatment with a dose within the official limits.

3. In juvenile chorea, 10 minims of Fowler's solution may be given, as an initial dose, three times a day.

*What Precautions are necessary in the Administration of Arsenical Solutions?*

1. They should always be given after meals.

2. They should be discontinued on the first symptoms of enteritis, skin pigmentation, or neuritis.

*Why are Hypnotics dangerous in the Early Stages of Delirium Tremens?*

Because the amount of alcohol consumed by the patient, before the attack, will have considerably minimised the digestive and absorptive powers of the stomach, so that a hypnotic administered early, may lie unabsorbed in the stomach for some time, and then may be all rapidly absorbed, and become dangerous to the patient.

*Suggest a Sedative for administration in such a Case.*

℞

| | |
|---|---|
| Sodii Bromid., | ʒ iv. |
| Tinct. Nucis Vom., | ʒ i. |
| Tinct. Capsici, | ʒ ii. |
| Liq. Ammon. Acet., | ℥ iii. |
| Aq. Camphoræ ad, | ℥ viii. |

Cpt. coch. mag. quarta quaque hora.

*Explain the Action of each Ingredient in the foregoing.*

Bromide of sodium in 15-grain doses acts as a sedative, and not as a hypnotic, in such a case.

Nux vomica and camphor act as cardiac stimulants, as well as gastric stimulants.

Capsicum is a stomachic and carminative, and in conjunction with the acetate of ammonium helps to allay the craving for more alcohol.

*State the Action of Castor Oil in Diarrhœa.*

Pure castor oil has a local, emollient, and sedative action; when it reaches the duodenum a small percentage of it is converted into ricinoleic acid, which acts as a purgative, and the unaltered remainder passes down the alimentary tract where it exerts a sedative and emollient action.

*What other Purgative is used in the Treatment of Diarrhœa?*

Calomel; as an initial purgative in doses of 5 to 10 grains,

or in smaller doses of ½ grain every hour; in the latter case it acts as an intestinal antiseptic.

*How is Ipecacuanha administered in Dysentery?*

Thirty grains of the powdered root, in water, should be given in a single dose on one day, after a three hours' fast, following a sharp purge, and no food or liquid must be administered for at least a couple of hours, to prevent vomiting. The following day 25 grains may be given, and so on till 145 grains have been taken.

*What Attempts have been made to prevent Emesis following such a Large Dose?*

The powder has been given in keratin-coated tablets, so that it may pass unaffected to the duodenum.

Emetine, the active principle, which is a powerful poison to the amœba, has been injected intramuscularly, in the form of the hydrochloride, in ½-grain doses, once a day.

*Describe the Action of Bromides in Epilepsy, and state how the full Physiological Effects are discerned.*

They diminish the hyper-excitability of the cortical centres.

Intense drowsiness and loss of the palatal reflex indicate that the drug is pushed far enough.

*Prescribe for a Case of Epilepsy.*

℞

| | |
|---|---|
| Sodii Bromid., | ℥ i. |
| Ammon. Bromid., | ʒ iii. |
| Potass. Iodid., | ʒ ii. |
| Potass. Bicarb., | ʒ i. |
| Tinct. Calumbæ, | ℥ i. |
| Aquæ ad, | ℥ vi. Misce. |

Coch. med. ter in die ante cibos.

*When are Bromides contra-indicated as Hypnotics?*

When pain is the cause of the insomnia.

*How would you prescribe Colchicum to relieve the Pain in Acute Gout?*

℞

| | | |
|---|---|---|
| Vini Colchici, | ℥ iv. | |
| Magnesii Sulphatis, | ℥ iss. | |
| Mag. Carb. Pond., | ʒ ii. | |
| Aq. Menth. Pip., ad, | ℥ xii. | Misce. |

Capiat ℥ii. statim et ℥i quartis horis p.p.a.

*What is Peculiar about this Prescription?*

The initial dose of colchicum wine is 40 minims. This quantity should never be exceeded or repeated, but is quite safe when given with a saline purgative.

*When is Colchicum contra-indicated in Gout?*

When the gout is of a retrocedent nature, as in such a case there is inflammation of internal organs, and colchicum is a powerful gastro-intestinal irritant, and very depressant in its effects.

*Give the Method of administering Suprarenal Gland in a Case of Hæmatemesis.*

In the form of liquor adrenalini hydrochloricus, 30 minims with 1 dram of water, may be given by the mouth, especially when a solution of chloride of calcium (1 dram in 4 ounces of water) has been previously injected slowly into the rectum. The liquor should on no account be given hypodermically, as, by constricting the small arteries of the body, it would cause a rise of general blood-pressure, and so aggravate the tendency to hæmorrhage.

*Should Ergot be administered in Hæmatemesis?*

No; ergot directly excites the heart muscle and causes a general contraction of the arteries all over the body, so that there is a rise of blood-pressure. Its action on the stomach is different from that on the uterus.

*What would you prescribe in a Case of Frequent Hæmoptysis?*

℞

| | |
|---|---|
| Calcii Chloridi, | ʒ iiss. |
| Diamorph. Hydroch., | gr. ¼. |
| Tinct. Aconiti, | ♏ xvi. |
| Acid. Hydrocyanici Dil., | ♏ xvi. |
| Aq. Chlorof. ad, | ℥ viii. Misce. |

One tablespoonful to be given every 30 minutes whilst the hæmorrhage is severe.

*Indicate the Chief Point to be considered in the Medicinal Treatment of Renal Calculus.*

The composition of the calculus. Should the concretion be composed of uric acid, the urine must be kept continuously alkaline for long periods, but should the concretion be of a phosphatic nature, by keeping the urine alkaline it would tend to encourage the deposition of more phosphates and so enlarge the calculus.

*What is "Gravel"?*

It is renal sand, and composed of uric acid or urates.

*How would you keep the Urine Alkaline for a Lengthy Period?*

℞

| | |
|---|---|
| Potassii Bicarbonatis, | ℥ i. |
| Potassii Citratis, | ℥ vi. |
| Aquæ ad, | ℥ xii. Misce. |

Capiat coch. mag. cum coch. mag. succi limonis quater in die.

*How would you increase the Acidity of the Urine?*

℞

| | |
|---|---|
| Hexaminæ, | ʒ iv. |
| Acid. Sodii Phosphat., | ℥ ii. |
| Aquæ ad, | ℥ xii. |

Capiat coch. mag. quater in die.

*When is Digitalis contra-indicated as a Diuretic?*

In the early stages of acute Bright's disease, when the arterial tension is high.

*Give the Treatment of Anasarca in Chronic Bright's Disease.*

By the administration of a saline cathartic. Calomel is not safe and diuretics are not reliable. Hay's method consists in the administration of 2 ounces magnesium sulphate in 2 ounces of water, after the alimentary canal has been emptied by a twelve to eighteen hours fast. This concentrated saline solution, by a process of osmosis, abstracts much fluid from the tissues, and many pints of fluid are evacuated.

*Prescribe an Efficient Diuretic in a case of Interstitial Nephritis.*

℞

| | |
|---|---|
| Potassii Acetat., | ʒ vi. |
| Succi Scoparii, | ℥ ii. |
| Inf. Digitalis ad, | ℥ viii. Misce. |

Cpt. ℥ ss quater in die ex aq.

*What is the Danger in reducing the Excessive Arterial Tension of Bright's Disease?*

It must not be lowered too much, as the risk of effusion into serous cavities is then greatly increased.

*How then would you strike the Happy Medium?*

By administering nitroglycerin; one minim of the official liquor four times a day, not only reduces the arterial tension, but will relieve the accompanying headache, dyspnœa, and giddiness.

*Write a Prescription for a Case of Acute Pleuritic Pyrexia.*

℞

| | |
|---|---|
| Tinct. Aconiti, | ʒ i. |
| Sodii Salicylat., | ʒ ii. |
| Liq. Ammon. Acet. | ℥ ii. |
| Liq. Morph. Hyd., | ʒ i. |
| Aq. Camph. ad, | ℥ viii. Misce. |

Cpt. coch. mag. tertia quaque hora.

*Explain the Object of the Morphia and state when the Prescription should be stopped.*

To allay persistent pain, continuous unrest, or incessant coughing.

The medicine should be suspended when pleuritic effusion has taken place.

*How would you prescribe Iron in a Case of Chronic Phthisis?*

℞

| | | |
|---|---|---|
| Liq. Ferri Perchlorid., | ʒ iii. | |
| Spirit. Chloroformi, | ʒ ii. | |
| Infus. Quassiæ ad, | ℥ viii. | Misce. |

Capiat coch. mag. ter in die p.c.

*When is the Administration of such a Tonic contra-indicated?*

It should not be given where a tendency to hæmoptysis exists, as in such a case the iron would stimulate the cardiac irritability and aggravate the bleeding. Nor should it be given in febrile or dyspeptic cases.

*Write a Prescription containing Quinine, Phosphorus, and Strychnine, for a Case of Phthisis.*

℞

| | | |
|---|---|---|
| Quininæ Sulphatis, | ʒ ss. | |
| Calc. Hypophos., | ʒ ii. | |
| Tinct. Nucis Vom., | ʒ iiss. | |
| Syr. Aurant., | ʒ vi. | |
| Aquæ ad, | ℥ viii. | Misce. |

Capiat coch. mag. ter in die semi hora ante cibos.

*Point out the Advantages of this Prescription.*

Quinine acts as an antipyretic, keeping down the fever and the night sweats; in conjunction with the nux vomica and calcium salt, it improves the appetite, and increases the strength.

*Has it any Disadvantage?*

Quinine, if given near bedtime, is liable to provoke sleeplessness and aggravate the night cough, as well as to excite a headache.

*When is Opium or Morphine contra-indicated in Phthisis?*

When the cough is attended with expectoration, it should be remembered that opium, or morphine, diminishes the bronchial secretion, causing an inspissation of the mucus in the air-passages, and making it more tenacious and difficult of expulsion. Moreover, there is also a temporary anæsthesia of the bronchial mucous membrane caused, and when this passes off, the patient becomes exhausted in an endeavour to expel the dried secretion.

*Prescribe a Cough Mixture containing Morphine.*

℞

| | |
|---|---|
| Liquor. Morphinæ Acetat., | |
| Aquæ Laurocerasi, | āā ʒ ii. |
| Syrupi Limonis, | ʒ vi. |
| Aquæ Chlorof. ad, | ℥ iss. Misce. |

Capiat coch. min. quartis horis si opus sit.

*How would you prescribe for a Phthisical Cough with Expectoration?*

℞

| | |
|---|---|
| Sodii Bicarb., | ʒ iii. |
| Sodii Chlorid., | ʒ i. |
| Spt. Ammon. Arom., | ʒ iii. |
| Spt. Chlorof., | ʒ v. |
| Aq. ad., | ℥ viii. Misce. |

Capiat coch. mag. ex aq. callid. pro re nata.

*What is meant by the Abortive Treatment of Syphilis and what Drug is given?*

It is an attempt to prevent the advance of secondary symptoms when the primary symptoms are in their early stage. Persist in the administration of mercury.

*In what Manner is this Drug best prescribed?*

℞
Hydrarg. cum Creta, gr. iss.
Pulv. Ipecac. Co., gr. iss.
Quininæ Sulphatis, gr. i. Misce.
Fiat pilula. Mitte c.
Capiat unam quater in die p.c.

*For how long should this be administered?*

About a year; the gums being watched closely, and the dose diminished should sponginess or ptyalism become marked.

*Indicate the Object of Dover's Powder in this Pill?*

To check the diarrhœa likely to be produced by the mercury.

*Write a Prescription for a Case of Tertiary Syphilis.*

℞
Potassii Iodidi, ʒ iiss.
Liq. Hydrarg. Perchloridi, ʒ iiss.
Spt. Chloroformi, ʒ iv.
Aquæ ad, ℥x. Misce.
Cpt. coch. mag. ter in die post cibos ex aq.

*What is "Euchlorine," and its Formula?*

It is an antiseptic mixture, formulated by Yeo, for use in various forms of fevers.

℞
Potassii Chlorat., grs. 30.
Acid. Hydrochlor. Pur., ʒ i.
Quin. Sulphatis, grs. 30.
Syrup. Aurant., ʒ vi.
Aq. ad, ʒ xii. Misce.
Capiat coch. mag. quaque secunda hora.

*Describe the "Empirical" Treatment of Acute Rheumatism.*

The administration of salicylates. It is called "empirical" because our knowledge of their actions is not sufficient to tell us why they are efficient.

*Mention the Drugs included under the General Term "Salicylates."*

Sodium salicylate, salicin, salicylic acid, salol, methyl salicylas, acidum acetyl salicylicum (aspirin).

*Write a Prescription for a Salicylate Mixture.*

R

| | | |
|---|---|---|
| Sodii Salicyl., | ʒ iii. | |
| Sodii Bicarb., | ʒ vi. | |
| Syr. Aurant., | ʒ iv. | |
| Aq. Menth. Pip. ad, | ℥ viii. | Misce. |

Capiat coch. mag. quater in die.

*What is the "Alkaline" Treatment of Acute Rheumatism?*

The administration of potassium bicarbonate in doses sufficient rapidly to render the urine alkaline. This method was founded upon the idea that in rheumatism there is an excess of uric acid in the blood, and if the alkalinity of the blood was increased the uric acid would be lessened.

*How should Aloes be administered as a Laxative in a Case of Hæmorrhoids?*

As a purgative, in such a case, aloes should not be employed, but as a laxative to stimulate the muscular coats of the atonic veins, it is administered in small doses in conjunction with cascara sagrada and nux vomica. Its administration, in all forms, is contra-indicated when the hæmorrhoids are inflamed.

*Write a suitable Prescription for its Administration.*

℞

| | | |
|---|---|---|
| Ext. Aloes, | gr. i. | |
| Ext. Nucis Vom., | gr. ¼. | |
| Ext. Cascara Sag. Sicc., | grs. ii. | Misce. |

Fiat pilula. Mitte xxxvi tales.
Capiat unam ter in die post cibos.

*What is the Advantage of the foregoing Combination?*

Aloes, as a laxative, takes from fifteen to twenty hours to act, but when combined with other laxatives, its effect is accelerated.

*Give a Prescription for Emesis in a Case of Croup.*

℞

| | | |
|---|---|---|
| Vini Antimonialis, | ʒ iii. | |
| Vini Ipecacuanhæ, | ʒ iv. | |
| Syr. Scillæ, | ʒ iv. | |
| Aquæ ad, | ʒ ii. | Misce. |

One teaspoonful every fifteen minutes till vomiting occurs, then half that quantity every three hours afterwards.

*Why are "Expectorant" Emetics indicated?*

So that after emesis, the expectorant qualities of the drugs may be available to establish and maintain free laryngeal secretion.

*Why should Opium not be administered in Infantile Convulsions? Suggest a Suitable Medicine.*

Because when its sedative effect passes off, it leaves the peripheral and central nervous apparatus more susceptible than before its administration.

℞

| | | |
|---|---|---|
| Sodii Bromidi, | ʒ ss. | |
| Chloral. Hydrat., | grs. iv. | |
| Liq. Ammon. Acet., | ʒ iv. | |
| Syr. Simplicis, | ʒ iv. | |
| Aq. Anethi ad, | ʒ ii. | Misce. |

Capiat coch. min. omni secunda hora.

*Write a Prescription for an Ointment for the Treatment of Scabies, and point out its Mode of Action.*

℞

| | | |
|---|---|---|
| Sulphur. Precip., | ʒ ii. | |
| Cret. Preparat., | ʒ iii. | |
| Saponis Mollis, | ℥ i. | |
| Paraff. Mollis, | ℥ i. | Misce. |

Ft. ung. Applic. ut dictu.

The prepared chalk aids mechanically in opening up the burrows of the Acarus scabiei, and the soft soap helps the penetration of the sulphur which is a parasiticide.

*Prescribe for the External Treatment of Psoriasis, and indicate the Precautions necessary in using the preparation.*

℞

| | | |
|---|---|---|
| Chrysarobini, | ʒ vi. | |
| Acidi Salicyl., | ʒ iii. | |
| Paraff. Mollis, ad | ℥ iv. | Misce. |

Ft. ung. m.d.u.

Owing to the irritating quality of the chrysarobin, the face and eyes of the patient must be protected. There may also be much inflammation of the more sensitive parts of the skin, such as the flexures of the joints, and due warning should be given to the patient; or they may be protected by the application of zinc ointment.

*Write a Prescription for the Treatment of Ringworm of the Scalp.*

℞

| | | |
|---|---|---|
| Hydrarg. Oleatis, | ʒ iss. | |
| Acidi Salicylici, | grs. xx. | |
| Adepis Lan. Hyd., | | |
| Paraff. Mollis, | āā ℥ i. | Misce. |

Ft. ung. To be well massaged into the scalp for ten minutes twice daily.

# SYNOPSIS OF CHANGES IN PHARMACOPŒIA 1914.

## 1. Drugs and Preparations not included in "B.P." 1898.

Acetonum.
Acidum Acetyl-Salicylicum.
Acidum Hydriodicum Dilutum.
Adrenalinum.
Barbitonum.
Benzaminæ Lactas.
Calcii Lactas.
Cantharidinum.
Chloral Formamidum.
Cresol.
Diamorphinæ Hydrochloridum.
Ferri Phosphas Saccharatus.
Guaiacol.
Hexamina.
Liquor Adrenalini Hydrochloricus.
Liquor Formaldehydi.
Injectio Strychninæ Hypodermica.
Methyl Salicylas.
Pelletierinæ Tannas.
Phenolphthaleinum.
Resorcinum.
Strontii Bromidum.
Syrupus Acidi Hydriodici.
Theobrominæ et Sodii Salicyl
Tinctura Picrorhizæ.

## 2. Drugs and Preparations included in "B.P." 1898, but not now official.

Cantharis.
Coca Preparations.
Conium Preparations.
Elaterium Preparations.
Jaborandi Folia and Preparations.
Liquores Concentrati.
Papaveris Capsula.
Physostigma and Preparations.
Picrotoxinum.
Sarsæ Radix.
Sodii Sulphocarbolas.
Stramonii Semina.
Unguentum Sulphuris Iodidi.
Unguentum Veratrinæ.
Veratrina.
Zinci Sulphocarbolas.

## 3. Drugs which must be of a standardised Strength.

Aconiti Radix, must contain ·4 per cent Ether-Soluble Alkaloids.
Belladonnæ Folia, must contain ·3 per cent. Alkaloids.
Ipecacuanhæ Radix, must contain not less th 2 per cent. Alkaloids.
Nux Vomica, must contain not less than 1 per cent. Strychnine.

## 4. Preparations which have been standardised.

Extractum Filicis Liquidum, 20 per cent. Filicin.
Do. Hydrastis Liquidum, 2 per cent. Hydrastin.
Do. Hyoscyami, ·3 per cent. Alkaloids.
Linimentum Aconiti, ·2 per cent. Ether-So Alkaloids.
Tinctura Aconiti, ·04 per cent. Ether-So. Alkaloids.

## 5. Preparations, the Strengths of which have been reduced.

Emplastrum Belladonnæ, half the previous strength.
Injectio Cocainæ Hypodermica, half the previous strength.
Injectio Morphinæ Hypodermica, half the previous strength.
Pilula Phosphori, half the previous strength.
Tinctura Colchici (Seminum), half the previous strength.
Tinctura Nucis Vomicæ, half the previous strength.
Trochiscus Acidi Carbolici, do. do.
Syrupus Ferri Iodidi, one third less Ferrous Iodid
Tabellæ Trinitrini, each containing $\frac{1}{100}$ grain.
Tinctura Belladonnæ, one third less alkaloids.
Do. Digitalis, 20 per cent. less active i gredients.
Do. Opii Ammoniata, one tenth less alkaloid
Unguentum Acidi Carbolici, 25 per cent. weake
Do. Hydrargyri, 20 per cent. less Hg.
Do. do. Ammoniati, 50 per ce less Hydrarg. Ammon.

## 6. Preparations, the Strengths of which have been increased.

Acetum Scillæ, double strength.
Spiritus Juniperi, do.
Unguentum Hydrargyri Subchloridi, do.
Tinctura Strophanthi, four times stronger.
Do. Opii, alkaloid increased 25 per cent.

## 7. Preparations, the Names of which have been altered.

Tinctura Iodi Fortis, formerly known as Liquor Iodi Fortis.
Tinctura Iodi Mitis, formerly known as Tinctu Iodi.

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